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Vol. XXXVI July, 1942 Number 7

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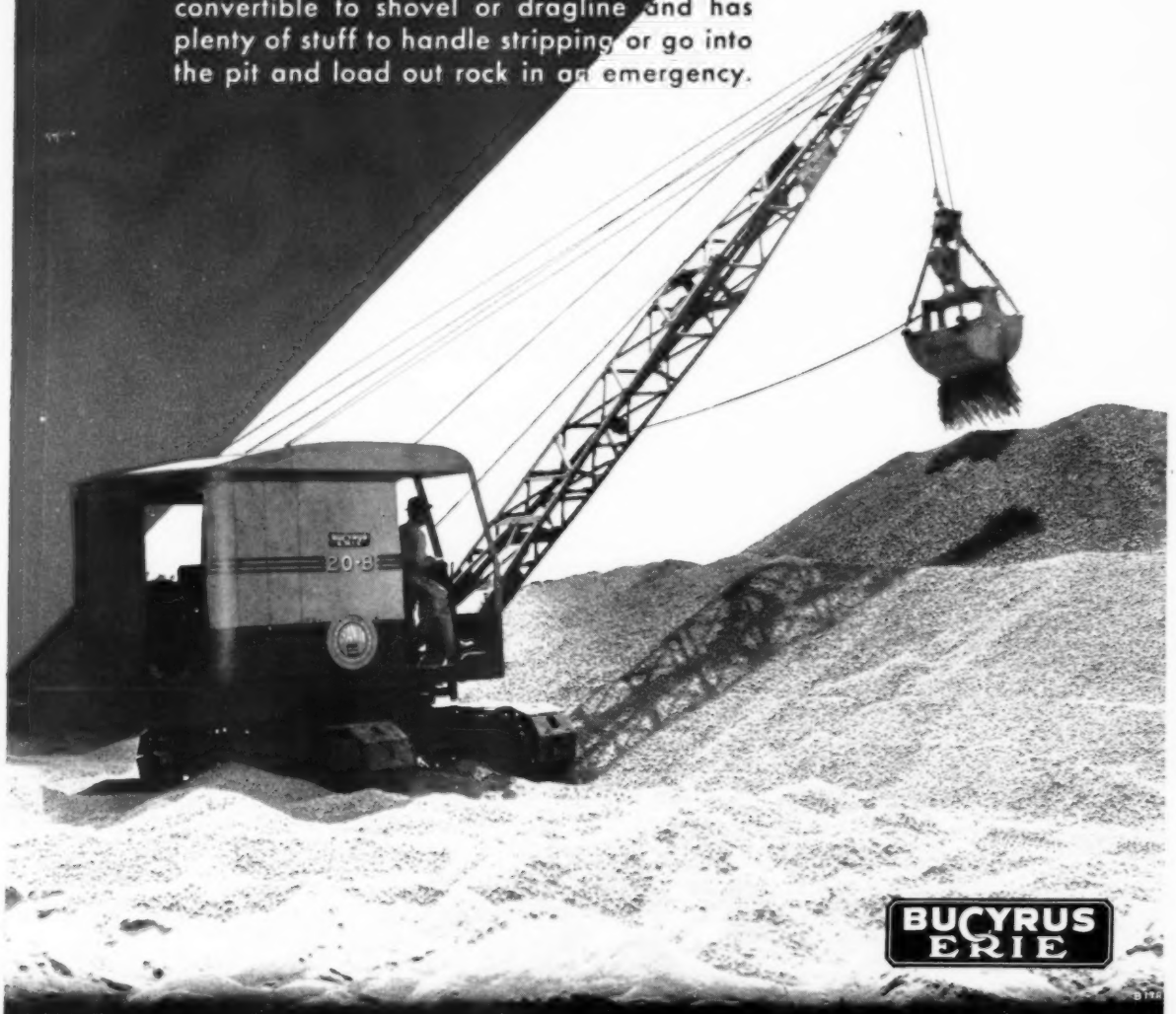

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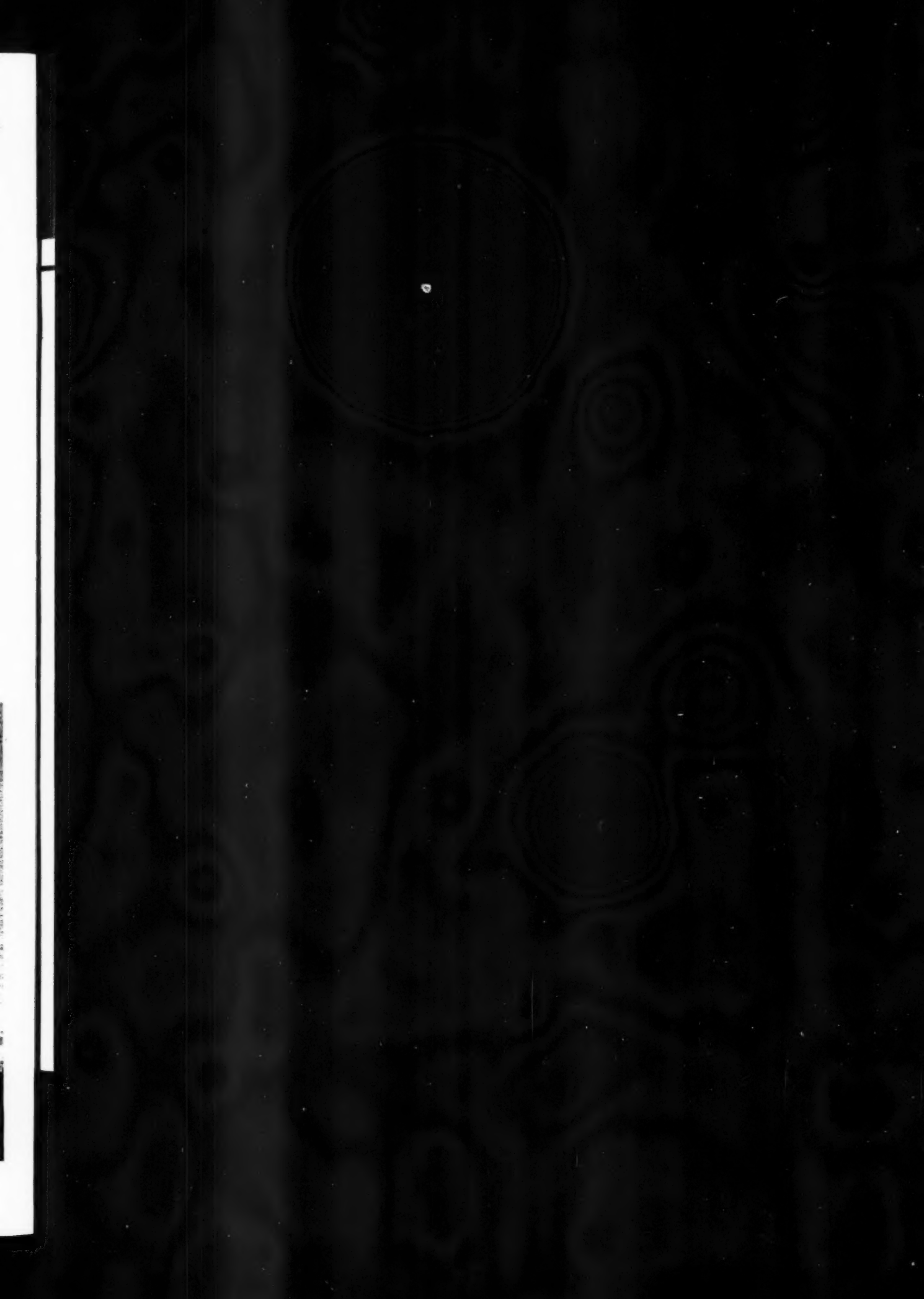

EXCAVATING ENGINEER

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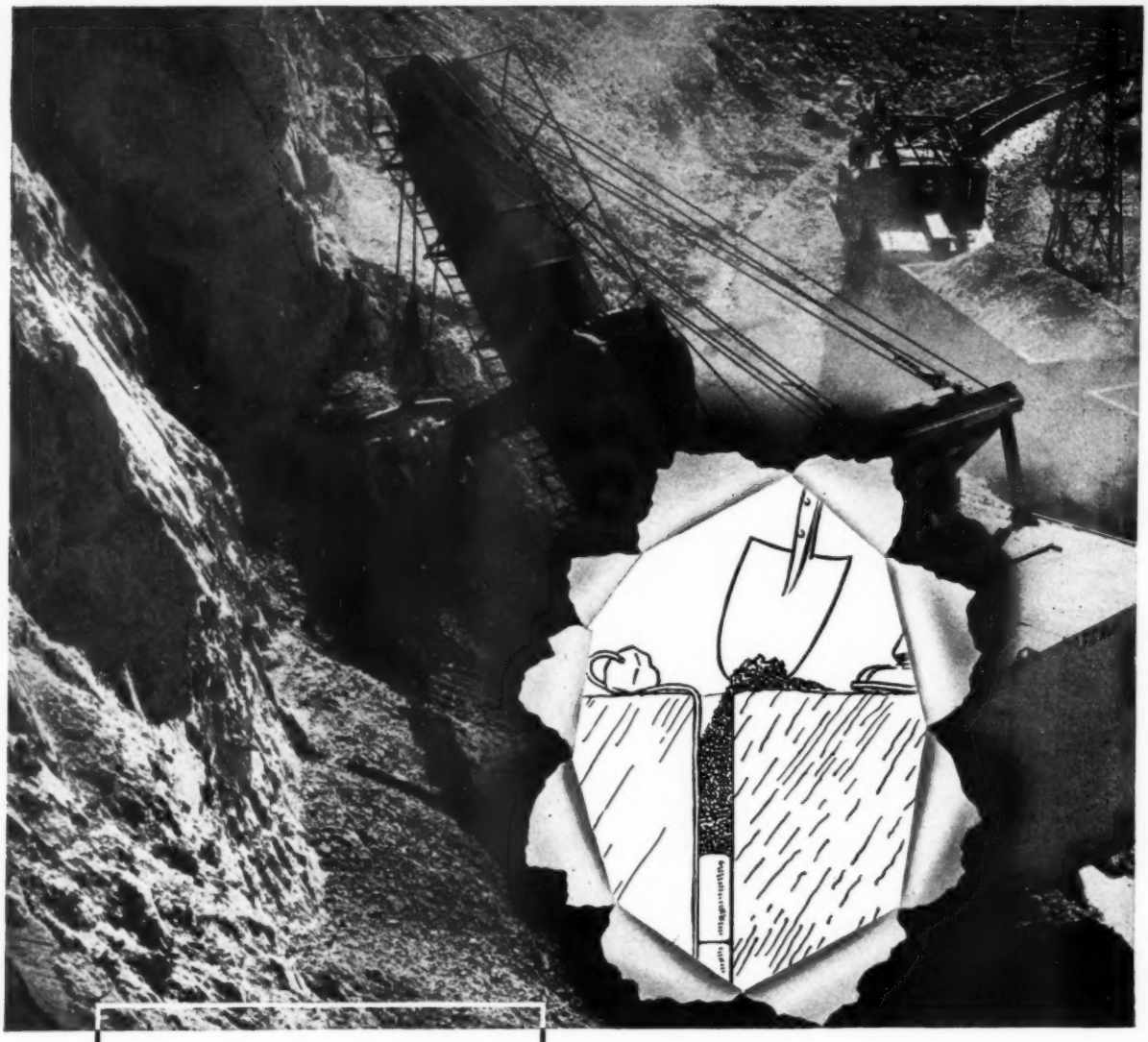

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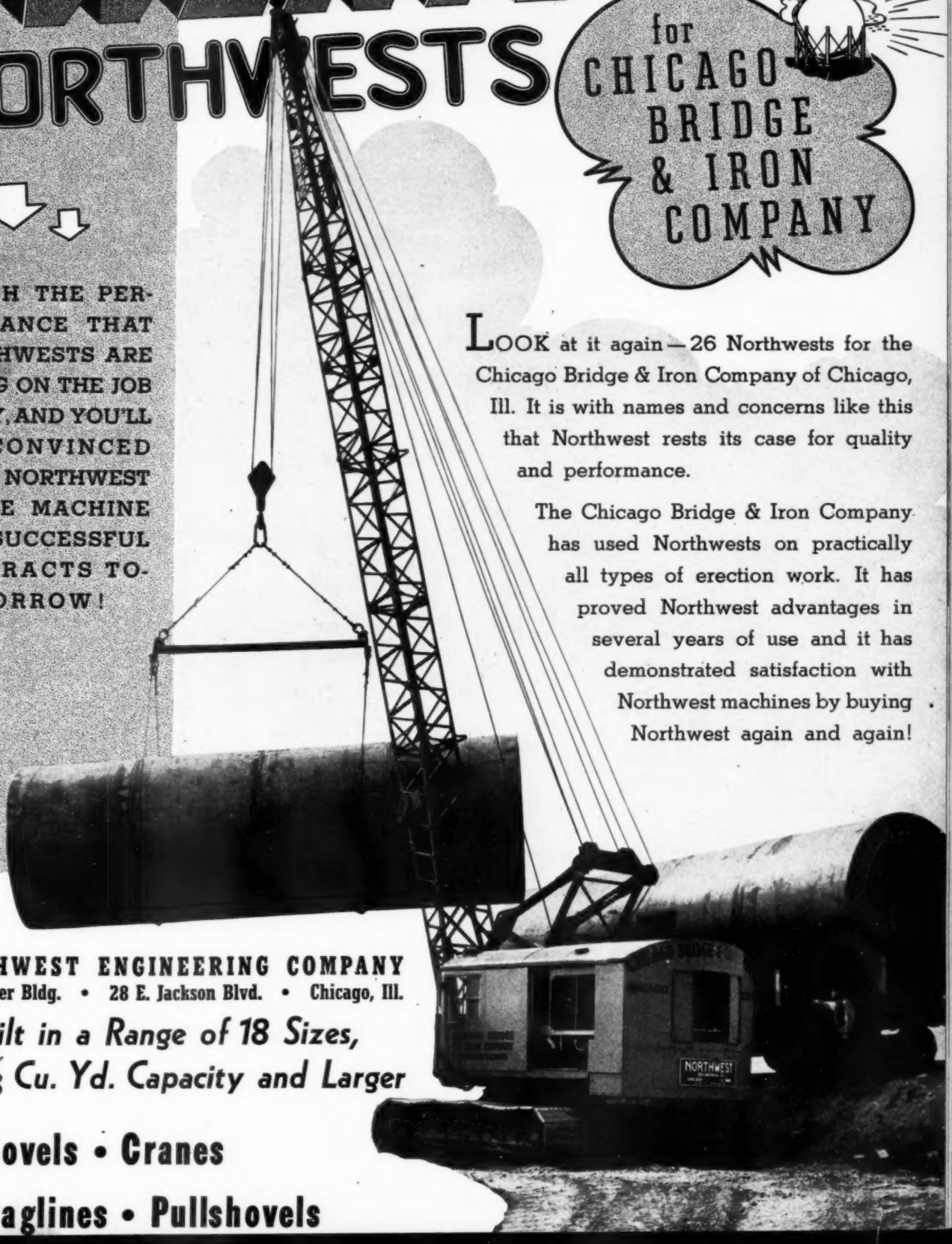

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• General view of the Camak quarry operations framed by the cables supporting the jetty stone derrick in the foreground.

Georgia Granite Quarry

Commercial crushed stone is produced in the modern manner at The Weston & Brooker Company's Camak quarry by an interesting plant and equipment line-up

By SPENCER JONES

NEAR CAMAK, GEORGIA, The Weston & Brooker Co., of Columbia, S. Carolina, is operating a granite quarry and crushed stone plant which offer some interesting production data. The quarry is roughly circular and covers about 80 acres at present, having been worked continuously since it was first opened in 1929. Height of the quarry face in this operation varies from 50 to 100 feet and the rock is a micaceous granite of excellent quality for commercial crushed stone.

Overburden at Camak consists of a mixture of earth and boulders varying in depth from 0 to 14 feet. A Bucyrus-Erie 29-B 1-yard electric shovel performs all stripping duties loading out the overburden to trucks equipped with 1½-ton St. Paul bodies.

Six-inch blast holes are sunk with three well drills, two Keystones, a 3 and a 51, and a Loomis Clipper Model 44 being used. These well drill blast holes extend an average of 8½ feet beneath the quarry floor level, in order to boost the total charge in the extreme lower portion of the face. The six-inch blast holes are 17 feet back from the face and 32 feet apart parallel to the face. A staggered row of wagon drill holes are also put down between the row of 6-inch holes and the quarry face as well as between each two 6-inch holes. The well drills make an average of ten feet of hole between sharpenings, and drill about three feet of hole per hour.

Wagon drill holes, 2½" to 1¼" in diameter, average about 30 feet

in depth and are made with an Ingersoll-Rand wagon drill at a drilling speed of about 27 feet per hour. Bits are changed about every ten feet and resharpened in an S-50 Ingersoll-Rand sharpener. Drilling of wagon drill holes is dry.

Hole Loading Operations

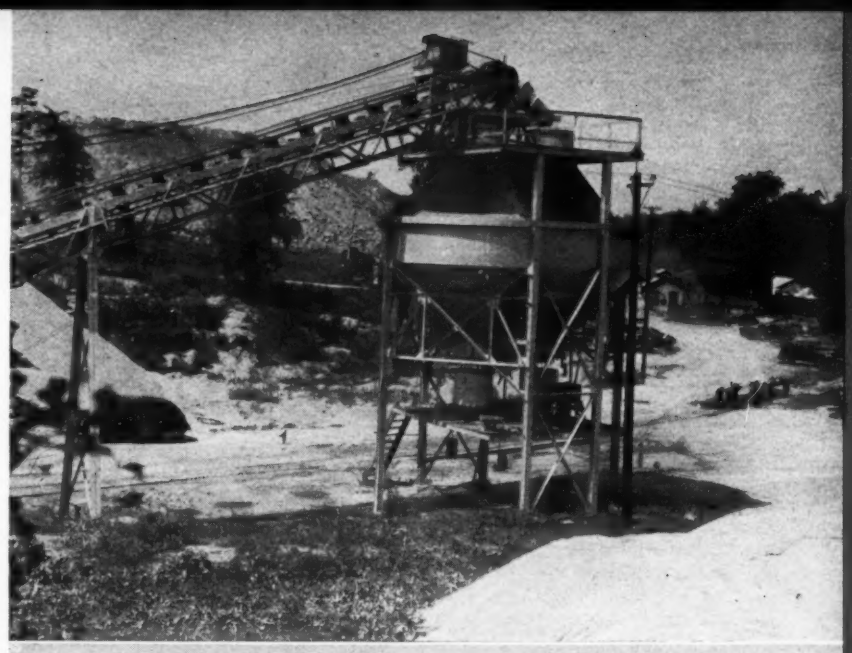
The six-inch blast holes are loaded with 60% gelatin in 5¼"x 24" cartridges which rest on top of the sand in the holes about three feet beneath the quarry floor level and extend up to within about 18 feet of the top of the hole. A single 5¼"x24" cartridge of 42% gelatin is placed 9 or 10 feet above, in the center of the rock sand stemming that extends from the top of the 60% gelatin to the surface.

Wagon drill blast holes are loaded with 50% gelatin in 1¼"x 8" cartridges up to eight feet from the top of the holes, and stemmed with rock sand the rest of the way. Primacord detonating fuse is used in all well drill and wagon drill blast holes.

Firing hook-up depends on the number of holes to be shot, and this number varies from 4 to 13 well drill holes and 9 to 36 wagon drill holes. Electric current is 110 volts and blasting caps are No. 6.

Blasts bring down about 4½ tons of rock per pound of explosive. Weight of rock in the solid is about 4,500 lbs. per cubic yard, and in the loose, about 3,150 lbs.

Fragmentation is fairly good, considering the type of stone and the height of the face. Some of the larger stones can be used for jetty work and are loaded on trucks and hauled across the exceptionally clean quarry floor to a derrick which lifts them onto railroad cars for shipment to construction jobs. Should larger amounts of jetty stone be required than are produced as a by-product of blasting for the plant, the quarry face near this derrick is drilled and blasted, thus saving



• Top: Washed stone and sand is loaded to trucks by this 6-compartment steel bin fed by a 24-inch conveyor belt. Center: Overburden at Camak, running to a maximum depth of 14 feet, is stripped by a 1-yard electric Bucyrus-Erie shovel. Bottom: Close-up of a portion of the plant's aggregate handling system.

nandling and hauling from the opposite side of the quarry floor.

Material requiring secondary blasting is drilled with S-49, JA-55 and J-5 Ingersoll-Rand jackhammers, the compressed air for which, as well as for the wagon drill, comes from a 1,000 cfm Sullivan and 1,350 cfm Ingersoll-Rand compressors. Secondary explosive is 30% gelatin, detonated with No. 6 caps and short lengths of fuse.

Shattered granite is loaded into trucks on the quarry floor with a 2-yard Marion 480 steam shovel at an average rate of 98 yards per hour, and a 2¼-yard Marion 482 electric shovel at an average rate of 110 yards per hour. Five Mack trucks with 8-yard Easton bodies haul rock an average distance of 2,000 feet from the shovels to the primary crusher.

• Left: A 2¼-yard Marion electric shovel loads out shattered granite rock to a Mack truck equipped with an 8-yard Easton body. Right: The 2-yard Marion steam shovel at work in a deep portion of the quarry.

These truck bodies are side dump and are tipped to discharge their loads into the primary crusher by means of a hook suspended from the boom of a 20-ton stiff leg American derrick. For this particular operation this method is more rapid and less expensive than the use of dumping mechanism built into each individual truck.

The primary crusher is a 48″x 60″ McCully Allis-Chalmers jaw crusher, belt-driven by a 200 hp motor. Material passing through the crusher falls on a 115-foot 6-ply rubber belt conveyor, 42 inches wide. The conveyor belt, driven by a 15 hp motor, dumps the crushed material onto a grizzly, the rails of which are 4 inches apart.

Aggregate Flow System

Pieces too large to pass between the grizzly rails slide off into a McCully Allis-Chalmers 20-inch secondary gyratory crusher. Material passing through the secondary crusher joins material which has passed between the grizzly rails and falls onto a 30-inch 6-ply rubber belt conveyor 125½ feet long that discharges its burden of assorted sizes of crushed stone into a 75-ton surge bin.

The surge bin supplies a Ross feeder which has a capacity of 250 tons per hour. From here the mixture is chuted into a 4-foot Symons cone crusher.

Material passing through the 4-foot Symons cone crusher falls onto a 24-inch 6-ply rubber conveyor belt 136 feet long discharging onto a F-800 W. S. Tyler double - deck vibrating screen. Stone scalped off the upper deck is chuted onto a 24-inch 6-ply rubber conveyor belt 146½ feet long. This conveyor discharges into a 3-foot Symons cone crusher and material, after passing through this crusher, falls onto the 24-inch conveyor, previously mentioned, which takes the discharge from the 4-foot Symons cone crusher and is re-circulated to the double-deck vibrating screen which has 2¼-inch square mesh in its upper deck. Plus material hitting the second deck is shunted to a storage bin by conveyor.

Material passing through this second vibrating screen falls onto a 24-inch 6-ply rubber conveyor belt 127½ feet long discharging onto a F-800 W. S. Tyler 5′x14′ double-deck vibrating screen.

Varying sizes of square wire mesh and perforated metal screen are used in the upper and lower decks of this double-deck vibrating screen, depending on demand for different sizes of stone. At the time the plant was visited 1½-inch square wire mesh was installed in the upper deck and 15/16-inch hexagonal perforated metal in the higher third of the

lower deck, with 1-5/16-inch hexagonal perforated metal covering the lower two-thirds of the lower deck.

Material scalped off the 1½-inch square wire mesh of the upper deck was chuted to one of ten storage bins for sale as + 1½-inch to — 2¼-inch stone. Material passing through the upper screen, but rejected by the lower screens, is chuted to another storage bin for sale as + 1-5/16-inch to — 1½-inch stone.

Material passing through the 15/16-inch hexagonal perforations of the lower screen is chuted to the upper decks, but rejected by the lower decks, is chuted to another storage bin for sale as + ¼-inch to — ⅜-inch stone. Screenings, passing through the ¼-inch square wire mesh of the lower decks, fall onto a 16-inch 6-ply rubber conveyor belt 700 feet long.

This 16-inch conveyor discharges screenings either to a raw screenings bin, a raw screenings stock pile (via a portable conveyor), or onto an Allis-Chalmers 4′x10′ double - deck vibrating screen, as desired. The vibrating screen has 1/10″x1″ rectangular wire mesh in its upper deck and 9/64-inch perforations in its lower deck.

Material, scalped off the upper deck of the double-deck Allis-Chalmers vibrating screen, goes, via a 16-inch rubber conveyor belt 25 feet long, to a bin for sale as coarse sand. Material passing through the upper deck, but rejected by the lower deck goes by a similar rubber conveyor belt to another bin for sale as medium coarse sand. Material passing through the lower screen is chuted to a water box and thence into a 16″x12′ double-screw sand washer, from which it is conveyed via a third small conveyor belt to a bin for storage until it is sold.

Stock Piling Procedure

There are also separate stock piles of the above sand sizes in addition to the stock piles of raw screenings. These are piled by the previously mentioned portable conveyor. Material from all four groups of stock piles is dropped into a tunnel, through which a 16-inch 6-ply rubber conveyor belt runs for a distance of 600 feet. This belt discharges into a wash chute which has small perforations in the bottom which is sprayed with water to cleanse the material passing through. From the wash chute the various grades of sand are fed through a swivel chute into freight cars. Raw screenings are not always loaded in this manner, but are occasionally trucked from stock pile or raw screenings bin to freight cars.

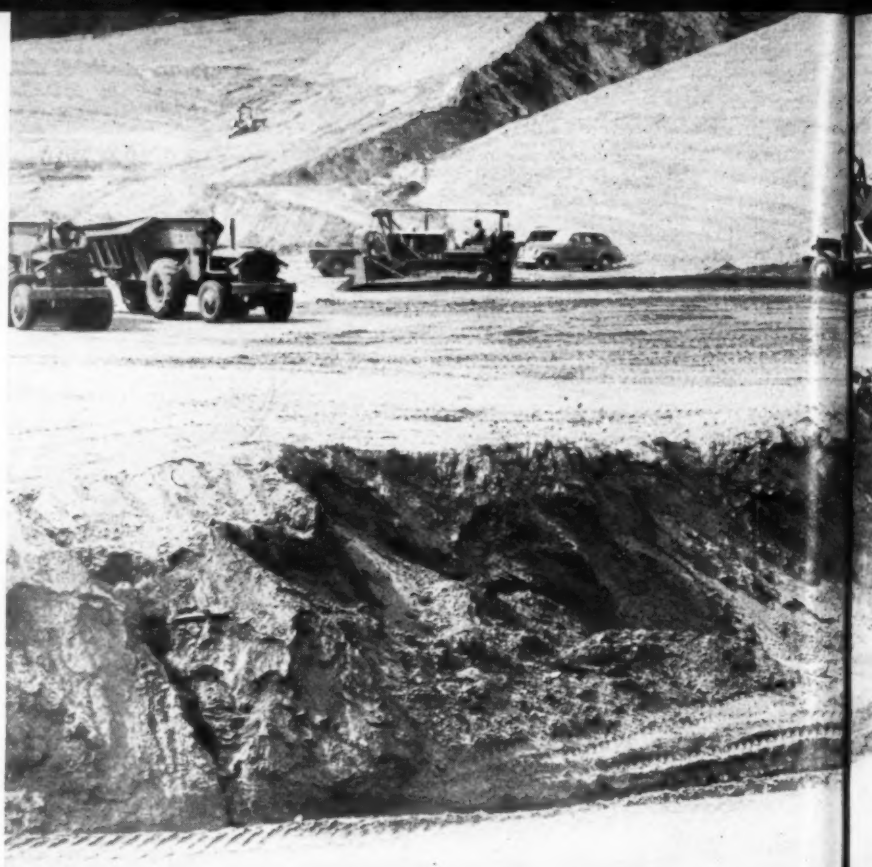
A ¾-yard Bucyrus-Erie 22-B electric shovel is kept busy stacking at the three sand bins, the raw screenings bin and the stock piles, incidentally keeping one Ford and one Chevrolet 1½-ton truck, each equipped with a 2-yard St. Paul body, on the move.

(Continued on page 370)

• **Left: Sand in a bin under the sand plant is stacked by a ¾-yard Bucyrus-Erie electric shovel. Right: A derrick equipped with a 1½-yard clamshell bucket takes care of necessary rehandling operations.**

two 5′x7′ W. S. Tyler Hum-mers. The larger pieces, scalped off the ⅝-inch square wire mesh of these Hum-mers, was chuted to a separate storage bin for sale as + ⅝-inch to — 15/16-inch stone. Small pieces, passing through the Hum-mers, fall into a 24-inch 6-ply rubber conveyor belt 135½ feet long. The belt discharges its load onto two double-deck W. S. Tyler Hum-mers, one 5′x5′ and one 5′x7′.

Both Hum-mers have ⅜-inch square wire mesh in their upper decks and ¼-inch square wire mesh in their lower decks. Small stone scalped off the upper decks is chuted into a storage bin for sale as + ⅜-inch to — ⅝-inch stone. Material passing through



Constructing

Materials present at the site of this $10,430,869 flood control structure are being used to advantage by U. S. Engineers during construction operations

By PAT DOWLING

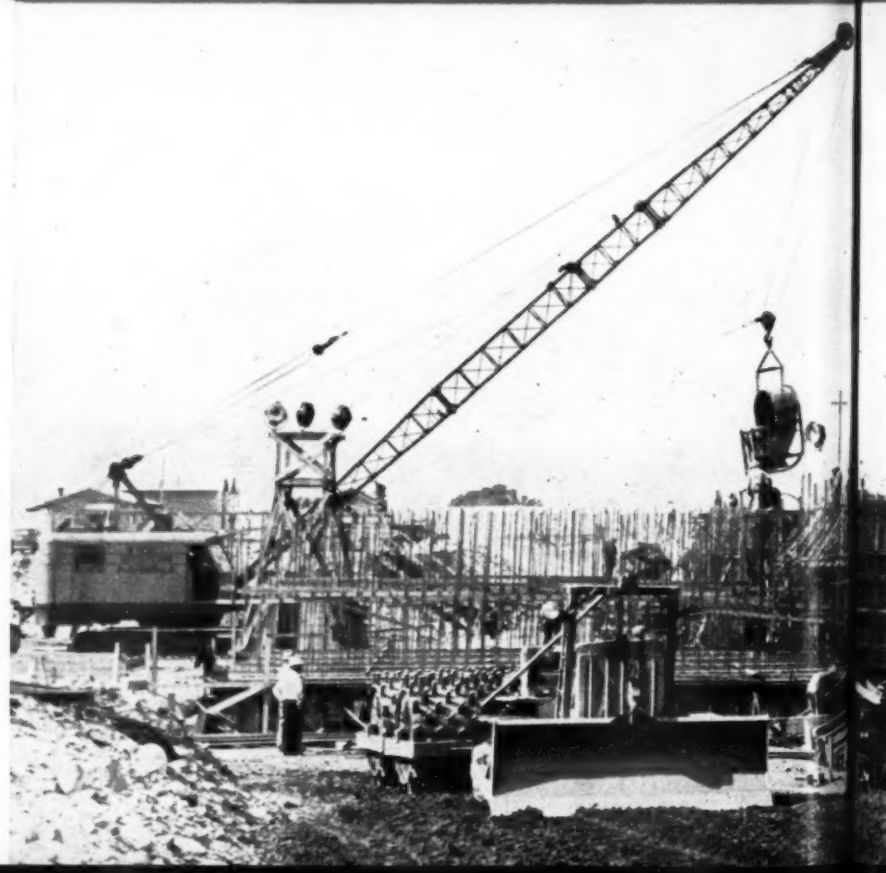
SANTA FE DAM, now under construction near Azusa, California, as an important link in the general flood control plan for Los Angeles County, is an earth-moving job which may be considered an outstanding example of the utilization of material found on the scene of operations.

During geological ages, drainage from the Sierra Madre mountains, flowing out of San Gabriel canyon from a watershed of 231 square miles, has deposited deep layers of sand, gravel and boulders, fanning out over an area of several square miles, to form a debris basin where numerous sand and gravel plants have been operating for years.

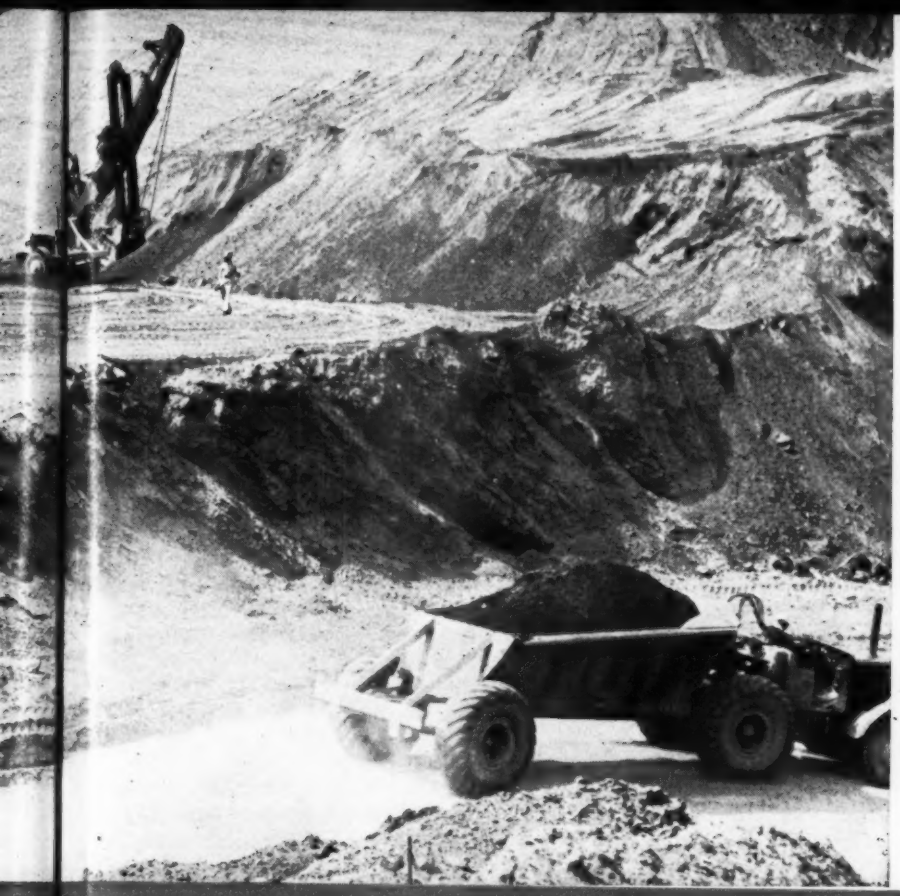
In this typical California "dry wash" which will provide the reservoir of Santa Fe Dam, lies a practically unlimited supply of material to be used for the embankment of the dam. The soils are residual, derived from metamorphic and igneous rock. Large areas of bare outcrop lie in the mountains above, while the outwash area of the San Gabriel river is a debris cone of deep alluvium composed of poorly sorted sand, gravel and boulders.

According to James G. Morgan, resident engineer of the U. S. Engineer Corps, under direction of which the comprehensive flood control program is being carried out, soundings have been made in the area to a depth of 500 feet, without reaching the bottom of this debris structure.

This deposit, covering the area to be used as a retaining basin, is thus furnishing the largest part of the total material needed, with the main exceptions of clay for

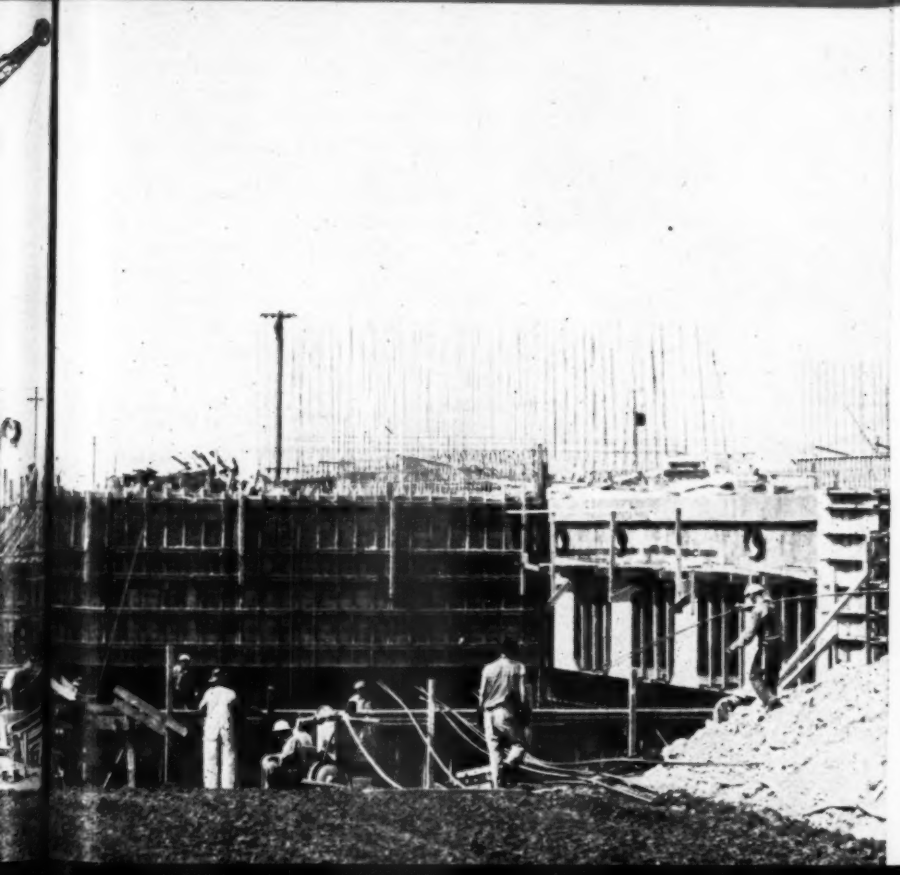


• A P&H crane places concrete during outlet works construction operations. In the foreground clay fill is being compacted by a caterpillar tractor equipped with a 'dozer and sheepsfoot rollers.



• Clay material for Santa Fe Dam's core is excavated by a 2½-yard Northwest shovel and transported to the fill area by a fleet of Euclid bottom-dump trucks.

Santa Fe Dam



the core of the embankment, and a relatively small amount of quarry rock, both found nearby.

Flood Control Project

The dam is located five miles downstream from the point where the San Gabriel river emerges from the foothills. The purpose of this unit of the major area program is to provide flood control for the San Gabriel Valley and the coastal plane area contiguous to the lower San Gabriel River. Regulation of the run-off at this point will reduce the cost of future channel improvements along the San Gabriel River and the Rio Hondo. This dam will confine the San Gabriel river in a restricted channel and act as a debris basin.

There are already three dams upstream from the Santa Fe with a total storage capacity of 89,000 acre feet. These are the San Gabriel Dams No. 1 and No. 2 and the Morris Dam, the latter a storage unit of the Metropolitan Water District. These completed dams upstream serve to act as a measure of protection, holding back flood water while the retaining basin in the valley below is being built. Also as part of the general plan, there will be another dam at Whittier Narrows, farther downstream from the Santa Fe, with eventual similar control all the way down through the agricultural district east of Los Angeles to Alamitos Bay, where the waters empty into the Pacific Ocean.

Some additional protection during the construction of Santa Fe Dam is afforded by existing levees which are the result of previous local flood control work, and one temporary fill thrown up since the start of work, which is to be removed later.

With a normally short rainy season to take into consideration and with weather otherwise generally favorable for smooth working conditions, there are few natural obstacles to interfere with scheduled progress.

Contractor for the Santa Fe Dam job is a group composed of Morrison-Knudsen Co., Inc.; Win-

ston Brothers Company; J. F. Shea Co., Inc.; and the Ford J. Twaits Company, all of Los Angeles.

The administrative staff at this job is composed of R. F. Rasey, project manager; A. H. Johnson, general superintendent; C. S. Bradley, chief engineer; J. M. Sullivan, office manager; and M. J. Crossett, purchasing agent.

Contract Prices

Notice to proceed was given August 8, 1941 on a total contract of $8,837,189, which with $1,593,670 to include Government furnished materials, engineering and inspection, will bring the total cost of the dam to $10,430,869.

The contract involves 830 calendar days as estimated, with construction thus planned to spread over 27 months' time, and with completion expected in November, 1943.

The dam embankment may be visualized as being in the general shape of a pair of ice tongs, with length from tip to tip of 23,800 feet, and with the extreme outer ends pointing in a northeasterly direction toward the mountains on the upstream side.

The embankment will have a maximum height above the stream bed of 92 feet. Practically in the center of the embankment will be the outlet works consisting of sixteen 6'x9' gated conduits, while the spillway channel will be located between the outlet works and the northwesterly tip of the dam.

The spillway crest, 1200 feet long, will be at elevation 496 while the crest of the dam will be at elevation 513.33. Storage capacity within the basin will be 47,200 acre feet.

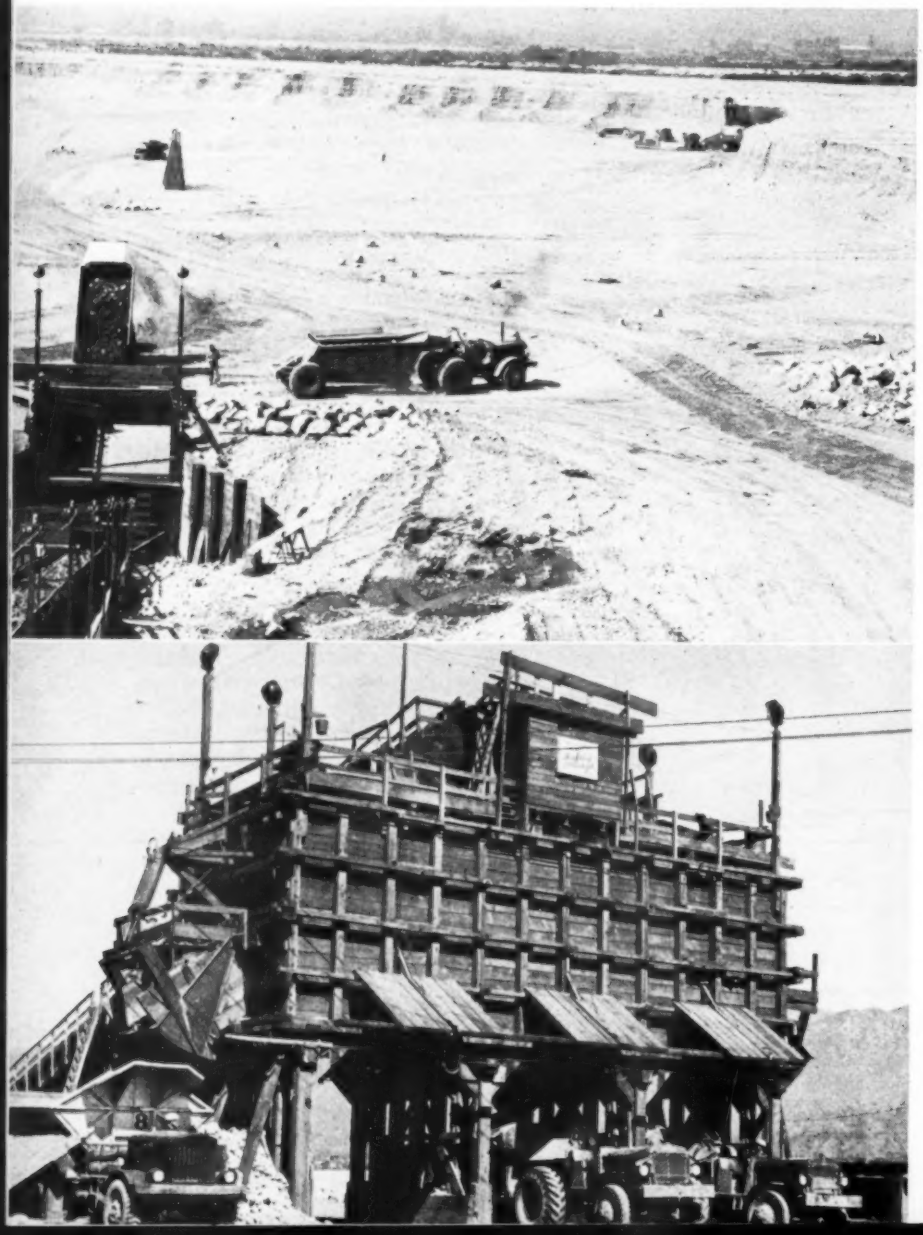
Because of the fact that the site is a wide, flat boulder wash, preliminary clearing was only necessary to the extent of dozing out some brush and cactus and grading for access and haul roads. Approximately twelve miles of haul roads were constructed, using the original terrain as foundation, and with the addition of clay surface, compacted and occasionally gravelled.

In the building and maintaining of these roads the contractor is using two Austin-Western 99M motor graders and two Model 12 Caterpillar graders, all diesel powered. This equipment is also used for a certain amount of maintenance work in the pits during excavation of material.

The longest haul road runs 4½ miles from a hill of solid clay which lies at the immediate base of the mountains and is being utilized in its natural state for the core of the dam. Hauling of clay for core structure is usually done during the night shift running from midnight to 8 A.M. during which time ten or more Euclid bottom-dump trucks are employed, along with a Northwest 80 diesel 2½-yard shovel kept at the clay hill at all times during construction operations.

Although this haul road follows the channel of the San Gabriel River down from the foothills and might be subject to washing out if a heavy flood occurred during construction, it would not be a serious operation to reconstruct such a section of road. At points of crossing the main present channel, this road is now protected by culverts which should carry normal run-off.

Among other early work, most of which was completed by the



• **Top: View of the borrow pit from screening plant No. 1. Truck in the foreground is dumping directly to hopper feeding 60-inch conveyor belt. Bottom: Euclids are loaded with screened material underneath the screening plant, and at the left a Six Wheel truck receives plus 6-inch material for riprap use.**

• Top: Placing the clay core material in a strip along the center of the dam embankment. Bottom: Rock riprap is spread on the embankment slope by a Caterpillar-mounted LeTourneau bulldozer.

time formal ceremonies starting construction were held November 8, 1941, was stripping silt and top soil which averaged about one foot in depth. This involved a total excavation of 640,000 cubic yards; also erection of an office building, shop, and the first pair of four screening plants required during the job.

Because the Santa Fe Dam operation is mainly one of excavating and hauling, placement of the grizzly plants in relation to the source of material and the respective disposal areas on the embankment was of primary importance from the standpoint of time and efficient use of equipment.

The total job involves 14,201,000 cubic yards of excavation, with 11,950,000 yards required by the embankment, most of which is being secured from the area immediately back of the dam.

Four Screening Plants Used

First embankment work was a one-mile section on the east side which is the part of the structure opposite the spillway channel side. Therefore, it was planned to erect the first two screening plants so as to be most accessible to this side of the work, and each placed on a line directly between the material areas and the embankment. Thus, the first two plants were erected approximately 3000 feet from the respective points on the embankment which they serve, and at distances from shovel operations which vary from 1000 to 2000 feet according to the gradually enlarging of the pit areas.

While these two plants are operating and while the first section of the dam is being built, a temporary levee provides protection during construction of the outlet works. After completion of the structure it is then planned to erect two more grizzly plants on the west side of the job, and divert the river channel through the outlet works structure, permitting start of embankment on the west side.

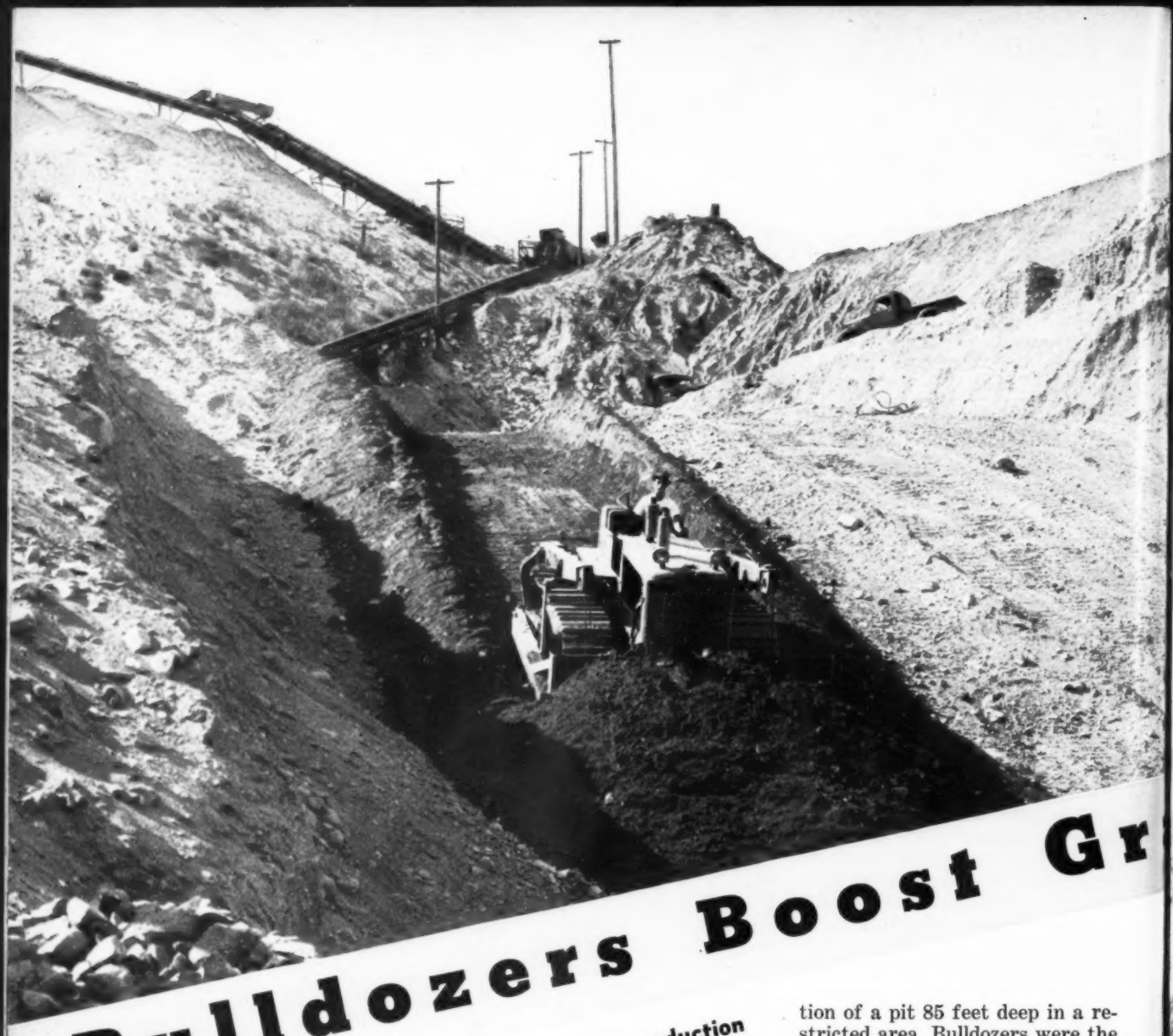
The No. 1 grizzly is a belt plant where trucks dump to hopper at ground level and material is carried to screens by a 60-inch conveyor belt. In the pit back of this plant, two shovels are employed, one a 6-yard Marion Model 4161, and the other a 2½-yard Northwest Model 80 gasoline shovel. Seven trucks normally run from these shovels to the screening plant, including four end-dump Six Wheels, Inc. (Hall-Scott powered) 12-yard trucks and three Euclid 13-yard bottom-dump trucks.

Working away from this screening plant to the embankment, the normal run includes nine Euclid 13-yard bottom-dump trucks, and two of the Six Wheels, side dump 20-yard trucks. While the Euclids haul all material under 6-inch diameters, the side dump trucks are hauling larger material, all over 6-inch.

The No. 2 plant is a bar grizzly set on a 26 degree angle, and fed by trucks which run up a ramp of 2% grade from the pit to the grizzly hoppers. Like the procedure at the other plant, the shovels first opened up a pit directly back of the plant, and work around in widening arcs at two sides of the pit.

In this pit the contractor is using six of the side-dump Six Wheels trucks and five of the end-dump Six Wheels units, all of

(Continued on page 371)



Bulldozers Boost Gr

Graham Brothers of California up their aggregate production to 60,000 tons a month with three tractor-mounted bulldozers. Here's the story of an efficient plant set-up

By FLOYD SUTER BIXBY

TRACTOR-MOUNTED bulldozers are a common enough excavating tool. For moving dirt 100 to 200 feet they are highly satisfactory. Occasionally, though, a job crops up to do the bulldozers even greater justice; thus spotlighting the efficient performance of these tractor-mounted pushing blades.

Such a job is the commercial aggregate manufacturing plant of Graham Brothers, located on the San Fernando Road 15 miles northwest of Los Angeles, California. Very little except the dispatcher's office and the lofty screening bins are visible from the highway, for over a period of 15 years the Rancho plant, as it is known, has literally dug itself in. This has resulted in the excavation of a pit 85 feet deep in a restricted area. Bulldozers were the answer to the problem and they have solved it profitably.

Officials of the company decided to purchase 'dozers a few years ago, when these machines came into their own as a specialized, individual excavating tool. Since conditions at the Rancho plant seemed especially well suited to bulldozers, they settled the argument against a continuation of the dragline-shovel-truck system of raw supply. Close working space, short pushing distances, and the individual tendency of the

• The tread marks of Graham Brother's Caterpillar-mounted LeTourneau bulldozer form an inverted "V" for victory as that unit pushes material to a trap feeding a conveyor belt.

• A heaping load of aggregate is shoved down hill to the 30-inch conveyor belt serving the screening plant by the Bucyrus-Erie bulldozer and International tractor combination.

bulldozer to roll more rough aggregate than is indicated by the size of the blade were all in favor of this type of equipment.

Cable Controlled 'Dozers Used

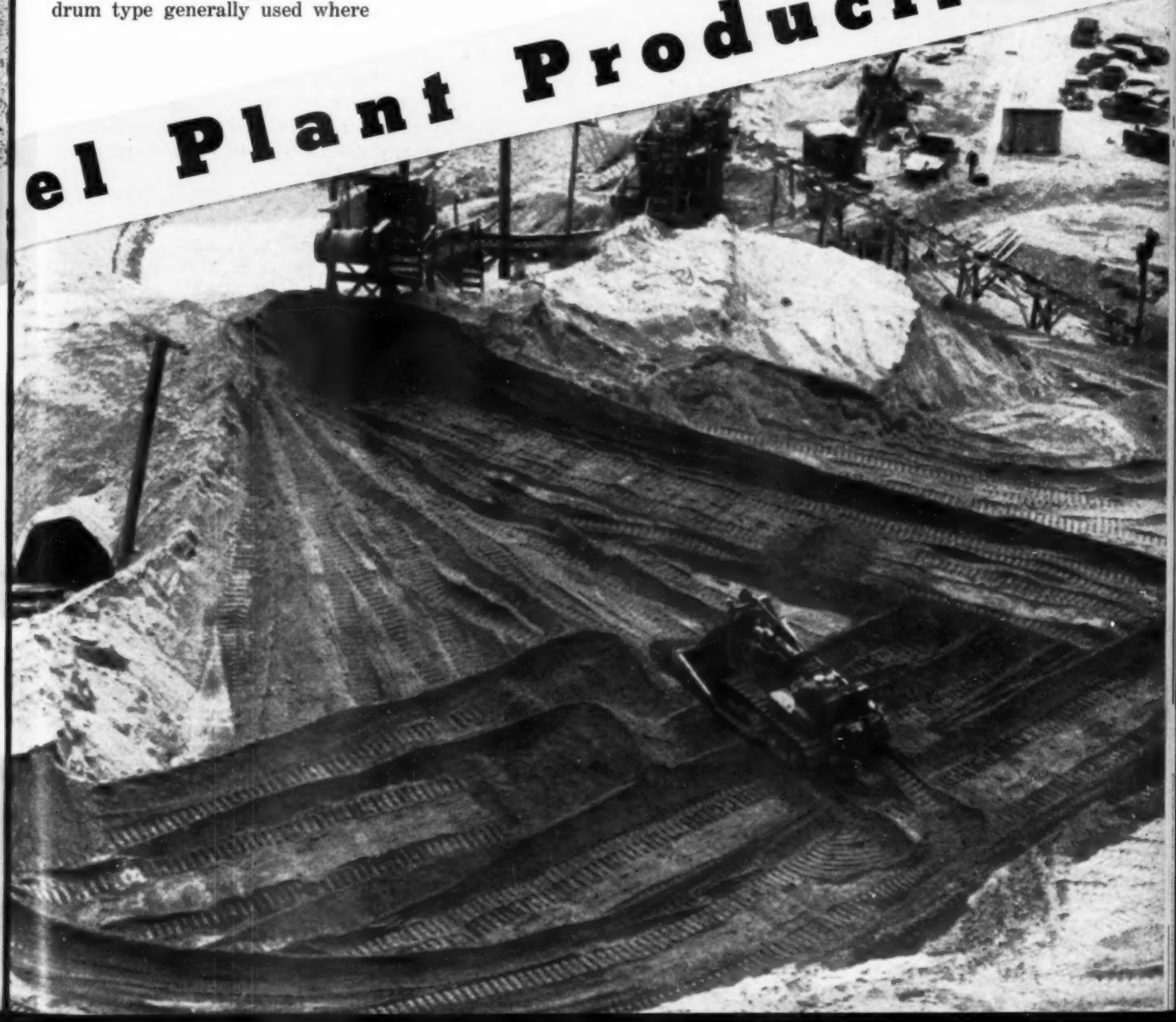
An International TD-18 full diesel tractor, carrying a cable controlled Bucyrus-Erie bulldozer and a Bucyrus-Erie Model P-14 power control unit was brought in with two Caterpillar D-8's mounting LeTourneau cable operated blades and power units. Since the primary role of these machines was bulldozing, all were purchased with single drum winches rather than the more expensive two drum type generally used where scraper work is also involved.

Now, after months of grueling service, Graham Brothers have proved their choice was wise. Those bulldozers operate month after month, and since December 7, 1941 have reached a peak war production of 60,000 tons a month. Maintenance? Sure, front idler bearings occasionally must be replaced; control cables kept in one piece; and oil and diesel fuel kept on hand. Everyone who operates a bulldozer contends with these factors. The answer is to keep spare idler bearings and control cables on hand for use when needed. Diesel fuel and lubricating oil are brought out to the pit by a fuel truck.

The problem of front idler wear on bulldozers is a misleading one, and it has caused real concern among many good tractor men. Actually, the reason for this wear is not so much the fact that the tractor carries a blade. The real reason seems to be that the machine travels backward as much as forward. In moving backward the front idler bearing takes an abnormal load, because the pull of the track belt is on the upper side. This pulls the front idler back against the idler springs, imposing a far greater load on the idler bearing than would be the case if the tractor were moving forward.

(Continued on page 370)

el Plant Production



Wake Up, America ...It's Late!

THE nation needs to awaken to the full gravity of the peril that confronts it.

It needs to understand that it is possible for the United Nations and the United States to lose this war and suffer the fate of France—and that this possibility may become a probability if the present tide does not change.

It needs to realize that there is grave chance of the Japanese pushing through India and the Germans driving through the Near East, to join their armies and resources in an almost unbeatable combination.

It needs to get away, once and for all, from the comforting feeling that while we may lose at the start we are bound to win in the end.

Only when fully aware of existing perils will the United States do its utmost. Pray God that awareness will not come too late, as it did in France!

Production Director Donald Nelson appeals for vastly increased industrial output on a 24-hour, seven-day basis—168 hours a week. Maximum production, in short.

Can we get it?

Not on the present basis—not under the psychology of recent years.

Not until we quit thinking in terms of less work for more money.

Not while there is greater concern about overtime pay than overtime production.

Not while farmer politicians are more interested in higher prices than raising more essentials.

Not while government bureaus—created to meet a depression emergency that is ended—continue to grab for themselves money needed for armaments.

Not while an army of federal press agents clamors to promote and perpetuate activities that have no present need or value.

Not while Congressmen try to put over useless schemes and take up the time of defense officials clamoring for factories and contracts as if war were a great gravy train.

Not while WPA, despite a shortage of labor, seeks to carry on projects which it doesn't have the men to perform or the need for performing.

Not while strikes hamper war production, despite a solemn promise that they would stop.

Not while the life-and-death need for uninterrupted production is used as a weapon to put over the closed shop.

Not while double time is demanded for Sunday work which is only part of a 40-hour week.

Not while a man can't be employed on an army project or in a war plant until he pays $20 to $50 or more to a labor racketeer.

Not while criminal gangs control employment and allocation of men to work on ships along New York's vast waterfront.

Not while fifth columnists are pampered and enemy aliens move freely in defense areas.

Not while the grim job of preparing our home communities against air raids and sabotage is gummed up with a lot of high-falutin', boon-doggling social service activity.

Not while pressure blocs clamor for higher benefits, bounties and pensions.

We will not get maximum production, in short, unless, first, we fully realize our awful peril; and, second, get over the gimmes of recent years.

Gimme shorter hours, gimme higher wages, gimme bigger profits, gimme more overtime, gimme less work, gimme more pensions, gimme greater crop benefits, gimme more appropriations and patronage, gimme plants for my Congressional district, gimme fees and dues to work for Uncle Sam, gimme ham 'n' eggs, gimme share-the-wealth, gimme $30 every Thursday.

France had the gimmes, too—had them till the Germans were close to Paris. Then everybody went frantically to work—too late.

France has no gimmes today—except gimme food for my baby, gimme a place to lay my head, gimme death.

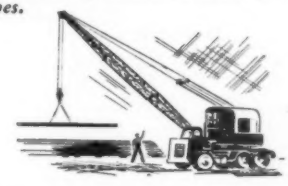
Reprinted by Permission of the New York World-Telegram.

"It's up to his skilled hands to get every hour of extra rope service we put in . . .

Here are some helpful tips you can pass along . . . things that mean even longer life for Roebling "Blue Center" Steel Wire Rope . . . steel saved for U. S. at War!

Lesson One:—take a piece of string and pull it gently . . . you'll find it will stand an unusual strain before breaking. But snap the same string quickly and it's easily broken.

Same thing applies to a wire rope. In any kind of hoisting operation, it's vital that the rope should have no slack at the beginning of the lift—else the load might be applied suddenly and then the impact on the rope will be greatly in excess of weight of the load being handled. So *don't jerk your ropes.*

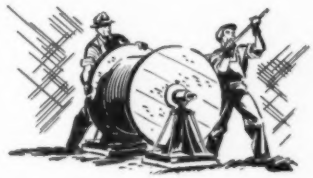


Lesson Two:—a hammer weighing only a few pounds can produce a blow having the force of a couple of tons. The load on a wire rope is like a hammer—striking a blow on the rope whenever you start the load too quickly. Even without slack, the rope gets a tremendous impact when power is applied too fast—as in the case, for instance, when the operator of a shovel moving a boulder tries to knock it out of the way instead of easing it out.

And it's the same when the rope is going the other way. When even a light load is stopped suddenly while being lowered, the rope is subjected to a much greater strain than the equipment could ever apply to it in hoisting. So *don't jolt your loads.* Brakes should be applied smoothly and uniformly, and at the slightest sign of "grab" should be eased off. Brake your load over a longer period and your rope will last over a longer period.

In general, shock loads will remove from the rope the very elasticity that is put in to absorb normal impact, while careful handling will preserve the rope's elasticity and keep it in condition to deliver long life. Of course, the way a machine is run always affects its general maintenance. It's a well-known fact that some people are harder on machinery than others. An operator can push a machine (and a rope) just so far to get extra work out of it—beyond that, the punishment takes its toll of both the machine and the rope—and breakage begins to cost more than the extra work is worth. But in these days when rope steel is vital to the war effort, *wire rope must not be abused.*

Lesson Three:—a pitch-fork was not made to shovel sand. Likewise, "borrowing" ropes is very seldom practical. In these times of priorities and shortages, some operators have been "borrowing" ropes from one operation and installing them on another.



Before you "borrow" a rope, make a careful analysis to see whether you won't get better ultimate economy out of putting the right new rope on the equipment that needs it, and taking the necessary steps to preserve the used rope and make it last on the job it's now doing.

Roebling "Blue Center" Steel Wire Rope is made to deliver a long lifetime of service—it has built a reputation for just that, wherever wire rope has a routine or unusual job to do."

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

More ways to help you conserve wire rope coming in this space next month.

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

For your convenience in writing to John A. Roebling's Sons Co., you will find a card bound in this issue.

Shots from the FIRING LINE

New York-Buffalo Superhighway

A bill authorizing construction of a superhighway or "thru-way" across New York State from New York City to Buffalo was signed into law May 23, by Governor Herbert H. Lehman.

In approving the measure the governor made public a memorandum from the New York State Department of Public Works, declaring it to be one of the best post-war projects under consideration.

"It is to be constructed as a limited access superhighway project on new rights of way with all crossings and grades eliminated," the memorandum said. "In other words, it contemplates a modern superhighway comparable to the one already built partly across the State of Pennsylvania."

The approved route would be along the west side of the Hudson River, extending from the New Jersey state line northerly to a point near Albany; thence across the state to the neighborhood of Buffalo; thence southwesterly paralleling the south shore of Lake Erie to the Pennsylvania state line.

James F. Tait

James F. Tait, manager of Bucyrus-Erie Company's office at St. Louis, died suddenly in that city on June 9, 1942, at the age of 54.

During twenty-six years of service with the same company, Mr. Tait became widely known to members of the industry in the Eastern and Mid-Western sections of the country. His friendly, helpful manner and the integrity of his business dealings changed his many business contacts into a wide circle of friends who will learn of his death with deep sorrow.

Mr. Tait, born in Scotland in 1888, came to the United States in 1905 with his father, mother and two brothers. They made their home in Conneaut, Ohio, where he worked as a mechanic on the local ore docks.

In 1916 he began work in the factory of, and acted also as an erecting engineer for, the Ball Engine Company, predecessor of the Erie Steam Shovel Company, which later merged with Bucyrus Company to form the present Bucyrus-Erie Company. He held this job until 1917 when he joined the sales department and later was made manager of the Kansas City branch office. Mr. Tait held this same position at the company's Philadelphia, Pittsburgh, and St. Louis offices successively. In 1919 he also spent nine months in the British Isles as a representative of the Bucyrus-Erie Company.

Mr. Tait is survived by his wife, Mrs. Eva Tait, and one son, James. A member of the Masons, he was interred with Masonic rites at Conneaut, Ohio, on June 13, 1942.

Senate Committee O.K.'s $110,000,000 Road Bill

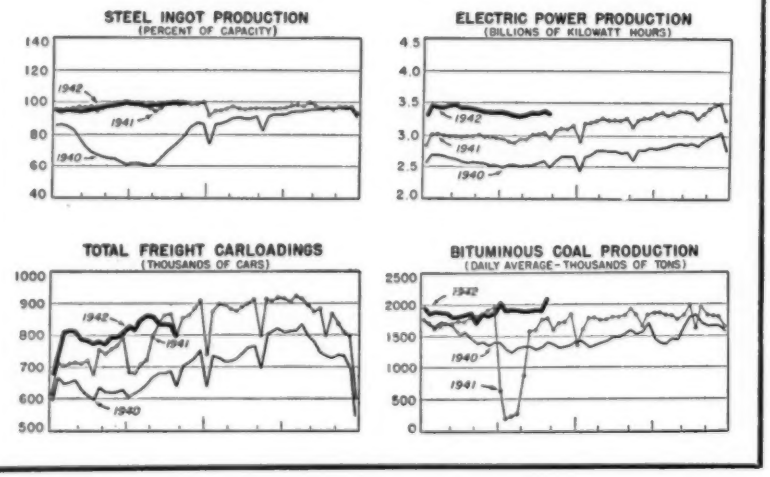
Stressing the need for speed, the U. S. Senate Committee on Post Offices and Post Roads on June 15, voted favorably an access road bill providing $110,000,000 for immediate expenditure. Constituting an amendment to the Defense Highway Act of 1941, the bill increases the authorization for access roads by $110,000,000 making the total $260,000,000. By further amendment these funds are made available for maintenance as well as construction.

One of the more important Senate amendments, offered by Commissioner MacDonald of the Public Roads Administration, by direction of Senator Hayden of Arizona, grants authority to incur contractual obligations immediately in lieu of the previous procedure which required the actual appropriation of funds before contracts could be awarded. Commissioner MacDonald said, in recommending this amendment, that it would go a long way in expediting the program which is already lagging.

Another Senate amendment changes present procedure for certification of projects by relieving the War Department of this responsibility with regard to access roads to sources of raw material and places such certification in the War Production Board. This, Commissioner MacDonald said, would eliminate much red tape and would allow certain small projects to go ahead which are now being held up for want of Army certification.

At the Senate hearings on this measure representatives of the War Department emphasized the need for additional access funds but evidenced little interest in the strategic network. Upon being questioned by members of the committee as to the apparent stalemate of the strategic network program, a representative of the Army stated that it was not their policy to approve projects on the strategic network as such, and added that they were only con-

BUSINESS INDICATORS



The Electric Hoist That Paid for Itself in Two Years

An $18,000 Investment Saved $9000 a Year and Got More Production

by H. W. CHADBOURNE
Industrial Department,
General Electric Company

THE Blue Diamond Coal Company of Bonny Blue, Va., had the problem of lowering coal down a steep mountain side. The slope was 3700 feet long; the average pitch 26.6 per cent; about a 950-foot drop.

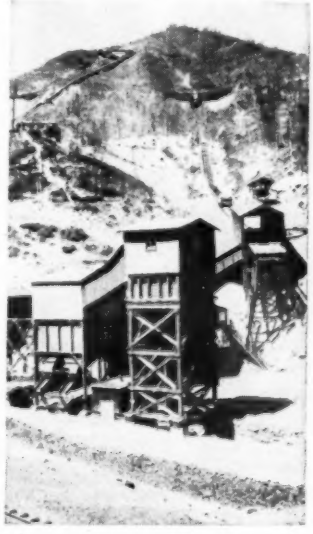
First, gravity was used—the force of the downgoing loads hauling up the empty cars. However, this proved unsatisfactory. There were wrecks and derailments, costing the company valuable production time and money. Another method was needed.

A study of the problem convinced the company's officials that it would be economical to invest approximately $18,000 to operate the hoist electrically. The results were even better than expected. The net saving due to the return of power to the line is about $7.00 a day, or $1462 a year.

But a still larger saving comes from the gain in production because of the absence of wrecks. This amounts to about $7550 a year, or a total saving of $9000 a year. Thus in two years the equipment paid for itself in money, and a great deal more in satisfaction.

Under the gravity system, there were several handicaps. All power generated by the downgoing loads had to be dissipated in the mechanical brakes and in lifting the empty car. This caused over-heating, excessive wear, and lack of accurate control, often ending in derailments and wrecks, with consequent loss of time and money.

600-hp, G-E induction motor operates hoist on this slope.



Another handicap was that the slope had a section near the middle which was almost level. This made it necessary to have the downgoing car travel at high speed on entering this section in order to haul the upcoming car during the same period. The maximum speed was 3000 feet per minute. Such high speed contributed to many wrecks.

Another fault of the gravity system was that, if the car was not fully loaded, it would start slowly and might not maintain enough speed to complete the trip. It could not be speeded up. If lower speed were required at any point along the way, mechanical brakes had to be used.

The electric equipment purchased for the change-over consists of a 600-hp, 900-rpm wound-rotor induction motor with reversible magnetic control. It operates as follows:

When the downgoing car is loaded, the brakes are released and it starts by gravity. An indicating tachometer shows the speed. As soon as the motor has reached full speed, it is thrown across the line. The over-hauling load tends to drive the motor slightly above synchronous speed.

Under that condition, the motor automatically becomes a generator and returns energy to the line. To increase the speed of the downgoing car, resistance may be cut into the rotor circuit by means of a controller.

When the car approaches the landing, the controller is quickly thrown to the OFF position, and then two or three notches to the reverse, thus bringing the entire system to rest.

When the motor is operating as a motor, it takes as much as 700 hp from the line. When regenerating, it pumps power back into the line—as much as 1000 hp at certain periods during each trip. The net return is 550 kw-hr a day.

***This is another example** of how General Electric engineers can help solve your construction problems. Their skill, plus G-E equipment, will likely bring about the best possible solution. If you have a problem, just get in touch with our nearest office. General Electric, Schenectady, N. Y.*

General Electric and its employees are proud of the Navy award of Excellence made to its Erie Works for the manufacture of naval ordnance.

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cerned with projects "essential to the war program." It was then disclosed, after further discussion, that projects "essential to the war program" meant projects which directly affect Army operations. For example, the movement of troops, troop supplies, and so forth.

Commenting on the position of the War Department, Commissioner MacDonald stated to the committee that in his opinion the policy of the Army regarding the certification of roads was "entirely too conservative." In many cases, he said, especially in the interior states, such projects could go forward without any interference with the war effort. Particularly was this so, the commissioner said, with regard to those projects requiring only an inconsequential amount of strategic materials.

By way of further explanation of the bogging down of the strategic network program, Commissioner MacDonald said the principal factor was the "basic lack of contractors and material." He then submitted figures showing that 957 strategic network projects had been received of which 662 had been approved and 428 certified by the War Department. Commissioner MacDonald stated that he thought this was a very good record and then referred again to "high prices" and "lack of contractors" as the principal retarding factors.

Rivers and Harbors Congress Backs Pipeline and Canal Jobs

By Bethune Jones

Construction of a pipeline across Northern Florida to provide a continuous flow of 250,000 to 300,000 barrels of oil a day, was recommended in one of a series of resolutions adopted by the National Rivers and Harbors Congress at its two-day annual convention which concluded May 30, in Chicago. The oil from the proposed pipeline would be transported north over the inland waterway system along the Eastern coast.

Also urged by the congress was the construction of a permanent barge canal across Florida and a canal across New Jersey from the Delaware River to the Raritan River and New York Bay.

Following heated discussion among the delegates, a resolution recommended by the resolutions committee, stating that "this congress expressly disapproves the so-called St. Lawrence seaway and power project in its present form" failed of adoption on a technicality.

Other resolutions approved by the congress urged:

Governmental financing of a federal agency empowered with authority and priorities to construct tow boats, barges and the pipeline across Florida.

Legislation which would enable the inland waterways to be utilized to the fullest extent.

The granting of priorities which would enable the inland waterways to be expanded as needed now.

Construction of necessary flood control systems.

Early completion of such irrigation and water conservation features of the federal reclamation program as would contribute most to war needs.

Impartial consideration by all officials of the maximum use of water transport problems arising in connection with the war program.

Many speakers at the convention stressed the important aid being rendered by the inland waterways and urged improvements and expansions in the 30,000-mile system. Proposals for increasing the waterways efficiency, as voiced by various speakers, included recommendations to:

Increase the flow of water from Lake Michigan through the Illinois waterway system.

Eliminate the bottleneck at Chain O'Rocks, in the Mississippi River near St. Louis, caused by shallow water and rocky ledges.

Install machinery in the fixed bridges over the Chicago Sanitary District Canal so that they can be opened to let large craft through.

Improve the Sag Canal which connects the Calumet industrial area on the Illinois-Indiana boundary with the Mississippi waterway system.

Deepen the channel in the Mississippi

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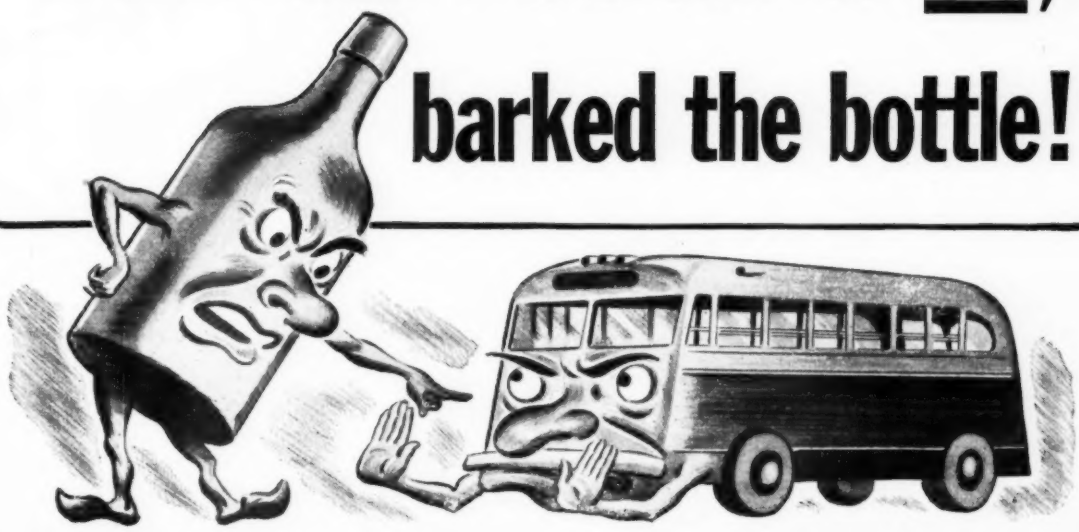
"Don't talk TOUGH to me," barked the bottle!



"**I CLAIM** *I've* got the toughest job in the world for Diesels! At the F. E. Reed Glass Co., manufacturers of all types of glass containers, in Rochester, N. Y., we have 5 Ingersoll-Rand Diesels, and boy do they work! 24 hours a day—seven days a week—at peak capacity! And do you know something? Since we discovered a certain oil, in 14 months we haven't had a stuck ring or valve. In 50,000 hours of operation we haven't had anything but perfect lubrication! Top that, my friend."

"**OKAY, BOTTLE!** Down in West Virginia where *I* hail from, the Pittsburgh-Weirton Bus people travel their buses over mountainous country. Toughest going you ever saw. They've covered more than 500,000 miles of it, too! And since we discovered *our* secret we've been able to more than double the time between oil changes. Rolling 21 hours a day, in low gear almost all the way, our engines are cleaner than ever, bearings in topnotch condition, rings free!"

BOTTLE: "Sounds almost unbelievable, Brother Bus! I don't see how you can do it—unless you use the same oil *we* do . . . RPM DELO."

BUS: "I do, Brer Bottle! Indeed, my boss wouldn't think of using anything else *but* RPM DELO. Fact is, I can't see why anybody should use anything else."

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from Memphis to New Orleans.

Declaring that in the inland waterway system America was not caught napping when the war started, Major General Eugene Reybold, chief of the U. S. Army Engineers, pointed out that large quantities of war materials are being transported over a system that was only partially developed in the last war. Expenditures on the waterways made since 1917, he said, have been amply justified.

Highway Contractors Confer On War Construction

A program of highway industry cooperation in the war effort was formulated at the war construction conference of highway contractors in Washington's Willard hotel, June 5-6. Secretaries of state groups affiliated with the American Road Builders' Association pledged all-out assistance to governmental war agencies to expedite war construction and transportation. Delegates stressed the essential role of the ARBA Highway Contractors' Division, which is taking the lead for the highway and airport construction industry in the war program.

A resolution passed by the conference directed the division's Washington office to confer with War and Navy Department officials in order to maintain a closer contact and cooperation between the state organizations and the district offices of the army engineers and the purchasing officers of the navy. Army officers at the meeting agreed that state group secretaries can give valuable assistance through their special knowledge of local labor supplies, equipment and materials for construction.

• A Speeder shovel is employed by the South African Engineering Corps to construct military roads in the Northern frontier district of Kenya. (Photo from European.)

Suggestions and assistance of highway contractor organizations were invited by representatives of the Office of Defense Transportation, the Office of Price Administration and the War Production Board. A resolution passed by conferees requested the ODT to extend the 25-mile limit on free movement of trucks to 50 miles for the highway industry. It was pointed out that the 50-mile limit would conserve as much rubber and expedite movement of con-

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WELDED ROLLED STEEL CONSTRUCTION

Cuts down excess weight, yet assures greater strength at vital points. Rivets used only at sections where quick replacement may ultimately be required. This welded construction, with other important features of Williams design, makes possible broader guarantees of long, profitable service.

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☆ PROTECTING WIRE ROPE AGAINST CORROSION ☆

This is Number 11 in a series of informative articles prepared by Macwhyte Wire Rope Company. The purpose of this series is to help wire rope users in these critical times to get the longest possible service from present ropes . . . through making useful facts on rope care more widely known.

The preceding article, No. 10 in this series, pointed out the causes of wire rope corrosion, where and when it was likely to strike. This article, No. 11, tells how to guard against corrosion. This and the previous ten articles in the series is available on request on your company letterhead.

Lubrication . . . its importance

No way has yet been found to remove the "causes" of corrosion. However, there is a method of protecting wire rope against corrosive elements . . . against atmosphere, weathering, or special conditions which subject the rope to either acid or alkaline substances.

That method is . . . *thorough lubrication.*

A recent and good illustration of such protective practice is found in the automotive industry. When car makers turned their plants into war production centers they ripped out massive automobile dies and machines worth millions, carted them to parking lots for the duration. When peace comes, back to work they will go.

Meanwhile these machines and dies are being protected against corrosion by a *thick coating of grease.*

Wire ropes, too, are machines. When in use (and more so when inactive) their parts need the protection good lubrication gives. Only when protected by lubrication (which retards corrosion) will they give the best possible service. Today, when we must all conserve what we have, such protection is doubly important.

Corrosion starts as soon as wires and strands are exposed to the elements and usually starts before one is aware of it.

In its early stages, corrosion is difficult to detect. The first signs are general discoloration of the wires of the rope. As corrosion progresses, the wires will become either pitted or covered with a reddish brown substance depending upon whether the corrosion is of an acid or alkaline type.

To prevent such destruction... LUBRICATE

Destruction came to these wire ropes much too soon. It might have been prevented. At an early inspection periodic lubrication would have added countless hours to the service life of these ropes.

Ⓐ *This sample,* in addition to showing evidence of wear, is very badly corroded due to having been subjected to corroding conditions of an alkaline nature.

Ⓑ *Lack of lubrication* caused the wires in this rope to become rust-bound. Fractures of this character occur when suddenly picking up the load or when the rope is flexed over the sheave, because the rust-bound wires cannot properly slide by each other. Notice the wires show very little evidence of wear.

NO. 632

Curb Corrosion and Conserve Steel

Corrosion is like an incurable disease which creeps up on a person gradually. You may check the damage it is doing, but you can never repair the damage done. Eventually it leads to early death of a rope whose service life could have been so much longer . . . with ordinary care.

Today corrosion is a very real enemy, destroying vital material (steel) needed for victory. If you inspect your ropes regularly, and apply lubricants freely, frequently, you are doing your bit to defeat this wire rope saboteur and get maximum service from your wire rope.

If you have further questions on corrosion (or any wire rope problems) feel free to write us about them. Simply address Macwhyte Company, 2940 Fourteenth Avenue, Kenosha, Wisconsin. Please write on your company letterhead.

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Whyte Strand
PRE-FORMED
WIRE ROPE

Macwhyte's premier wire rope, famous for its strength, toughness, and internal lubrication

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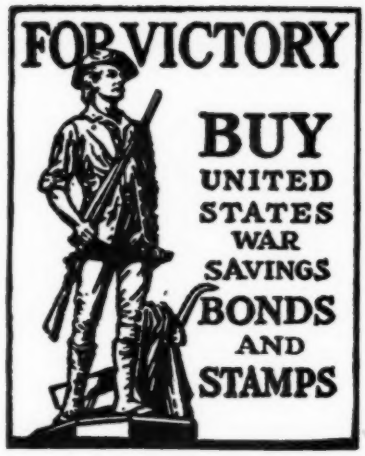
struction materials for war purposes. The division's Washington office was also directed to advise the WPB of the readiness of the state groups to assist in the program for accumulation of used equipment.

ARBA Engineer-Director Charles M. Upham, opened the conference with an outline of the war-construction program from the road builders' point of view. ODT orders affecting highway contractors were explained by F. O. Terrell, consultant, ODT Division of Motor Transport, while Walter Shoemaker, chief, OPA Construction Machinery Division, explained rental regulations affecting construction equipment. Utilization of used equipment was discussed by H. O. Penn, chief, used machinery section, WPB Construction Equipment Branch.

Colonel E. C. Ischner, chief, air force projects section, U. S. Engineers, declared, "The airport program is so large in scope that before summer is over it will be necessary to convert money into air fields at the rate of many hundred million dollars a month, if we are to complete the program for the air force by the first of the year, the time set for completion of the immediate projects." The critical situation faced by U. S. Engineers with regard to materials and manpower was emphasized by Major John Soule, chief, roads subsection, rivers and harbors section, and Captain James C. Belda, port and supply depot section. Captain N. H. Truax also represented the rivers and harbors section at the conference.



Wartime Explosive Rules

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Correspondence between our attorney and the Explosives Control Division of the Bureau of Mines of the U. S. Department of the Interior has finally and categorically clarified the interpretation of the Statute and Regulations governing the licensing of individuals and corporations for the purchase and use of explosives during war time, as follows:

1. Regardless whether the employer operates through a licensed foreman or not, or is himself a licensed foreman or not, the employer in all cases must take out a purchaser's license.

2. If the employer is an individual, and personally does all the using of explosives, this one license is enough.

3. If the employer is an individual, and personally is present and supervises every use of the explosives by his employees, he can operate under merely his purchaser's license; but the Bureau of Mines recommends against this procedure, "except in the case of an individual who employs a very few persons and who constantly supervises their operations." In other words, this procedure is permissible only if the employer has so few employees that he is always present and personally in charge whenever explosives are used.

4. If the employer is an individual, then unless he personally is present and supervises every use of explosives, he or one of his employees must also have a foreman's license. In other words an

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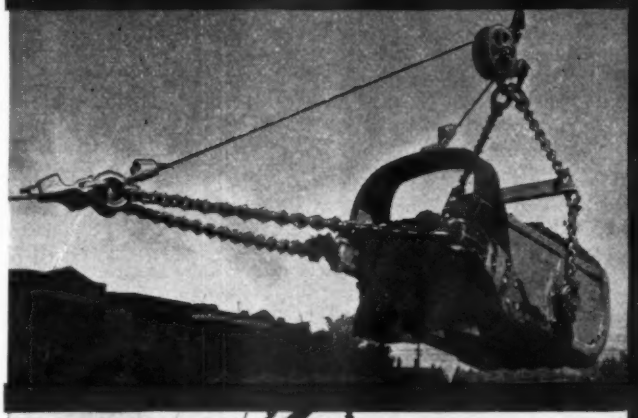
Here's why

RED ARCH BUCKETS



YOU get big output with modern Bucyrus-Erie Red Arch buckets because they are streamlined for speed. Strong all-welded construction means minimum weight to lift and swing on every cycle, and that means more cycles per hour and more output per day. You get more dirt on every pass, too, with these outstanding buckets. Exclusive Beco Tiger Teeth bite into the digging in just the right way to get a heaping load in the shortest time. The pitch and shape of the Tiger Teeth, the location of the drag hitches with respect to the teeth, the location of the center of gravity of the bucket, the sharp cutting edge between teeth, all these are correctly balanced to give you high-speed digging. Proper weight distribution, placement of arch and hoist chains give a bucket that rides easily during fast swinging. The smooth curved interior of the bucket and the height of the arch give free quick dumping of even sticky material.

You don't waste time with Red Arch buckets. Operating time is spent actually moving dirt. Notice that the inserted forged-steel teeth have sufficient metal so they can be sharpened by reforging as well as by welding. These teeth are the easiest to remove and replace of any on the market. Their efficiency means real added output for you. These modern buckets are furnished with exclusive Red Arch incandescent butt-welded chain which gives up to 50 per cent longer life than ordinary chain.

Red Arch buckets are built in three types, for light, medium and heavy digging. Sizes range from ⅜ to 20 yards. Write today for full information on the size and type you need.

Bucyrus-Erie Co.

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individual employer can get licensed as his own foreman.

5. No employer, even if licensed as a purchaser, can issue explosives to his employees, except either through a licensed foreman, or by being licensed as a foreman himself, or under paragraph 3.

6. If a partnership is licensed as a purchaser, one of the partners, or any employee, can be licensed as foreman.

7. If both the employer and a foreman are licensed, then either of them can purchase the explosives for the foreman to issue.

8. If both the employer and a foreman are licensed, then either of them can personally use explosives purchased by either himself or by the other.

9. If the employer is a corporation, it must operate through a foreman, and he too must be licensed.

10. Neither a licensed employer-purchaser nor the employers' licensed foreman can sell explosives unless such seller also holds a vendor's license; except that a licensed foreman can sell to employees of his employer, but only for use on behalf of the employer. Thus, without a vendor's license, neither an employer nor his foreman can sell explosives to an employe for the employe's private purposes. And, without a vendor's license, neither a principal contractor nor his foreman can sell to an incorporated or other large sub-contractor at all, even for purposes of the principal contractor.

11. Without a purchaser's license, an employe cannot buy for his private purposes.

12. An incorporated or other large sub-contractor must apply all the foregoing to his operations, just as though he were a principal contractor. But an individual subcontractor, who is being treated as such for purposes of social security and legal responsibility, but is in all other respects a mere employe, can be treated as an employe under explosives regulations."

All types of explosives licenses are obtainable at the office of your County Clerk. (If your County Clerk does not issue them, he'll be able to tell where you can get them.) The fee for each license is 25 cents and it is good for a one year period.

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● Slashing into rock and dirt on excavating work means constantly changing loads . . . no one shovelful may use the same amount of power. That's why the fast throttle regulation of the Pierce Flyball Governor is so important . . . here, and wherever power regulation is required.

The instant the shovel begins to dig in the Pierce Governor goes into action . . . delivering power needed by maintaining engine speed constant. This not only means more efficient and economical operation but insures longer life of equipment.

In addition to their highly sensitive control, Pierce Governors bring you the rugged, precision construction so essential to dependable performance under every condition encountered in the field. That's why so many equipment manufacturers use Pierce Flyball Governors as standard equipment.

Any new equipment you can buy will serve you better and longer if it's Pierce-governed. If your present equipment is without a governor, Pierce can supply you on receipt of a preference rating certificate. Or, if your governor needs service, see your nearest Pierce distributor, or send it to the factory, with preference rating certificate.

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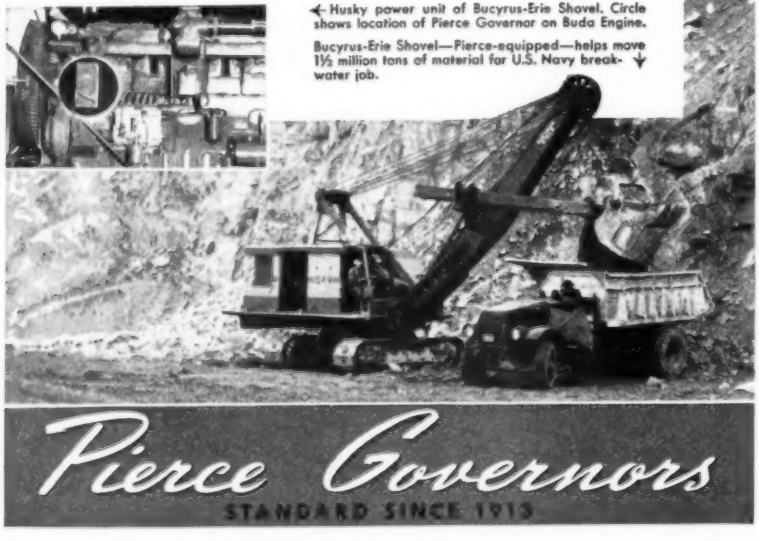

← Husky power unit of Bucyrus-Erie Shovel. Circle shows location of Pierce Governor on Buda Engine.

Bucyrus-Erie Shovel—Pierce-equipped—helps move 1½ million tons of material for U.S. Navy breakwater job. →

Pierce Governors

STANDARD SINCE 1913

May Second Largest Construction Month

The volume of construction contracts awarded in May was the second largest on record, having been exceeded only in August 1941. The May total of building and engineering contracts let in the 37 eastern states was $673,517,000, according to F. W. Dodge Corporation. This was 35 per cent greater than the total for the preceding month and 23 per cent greater than the total for May 1941.

Since the large May volume represented principally war construction, it was natural that non-residential building and heavy engineering work should predominate. Non-residential building contracts amounted last month to $297,885,000, compared with $234,939,000 in the preceding month and with $202,492,000 in May of last year. Heavy engineering contracts (public works and utilities) reached a total of $227,668,000 last month, compared with $101,706,000 in April and with $144,934,000 in May of last year. Residential building contracts (including army and war-worker barracks along with the other usual types of housing) amounted to $147,964,000 last month, compared with $162,097,000 in April and $201,274,000 in May 1941.

WPB Construction Rules

In a move to make all possible material and effort available for immediate war production, top officials of the U. S. War Production Board and the War and Navy Departments have established broad principles governing all wartime construction which will bring such building under more rigid conservation control.

The program means that no new plants will be built unless they are absolutely essential and can meet seven newly established criteria. This applies not only to direct war plants but to all other construction, both publicly and privately financed.

One of the main reasons for the new policy is that all critical materials are needed for war production now, and no

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The American Tiger Brand Army is on the march

FOR CONSTRUCTION Check over in your mind the important equipment that requires wire rope for its operation—shovels, draglines, cranes, derricks, scrapers, to mention a few. Then think of the vital part such equipment is playing right now in the construction of war-time facilities. This means that good wire rope like American Tiger Brand is indispensable for the success of our war program.

FOR MINING Because of its strength and superior fatigue-resisting properties, American Tiger Brand Wire Rope will improve operations wherever used. On the mechanized equipment used in mining, where ropes are handled frequently, overwind on drums, bend around small sheaves and are subject to excessive loads under adverse conditions, this rope gives long and trouble-free service.

FOR OIL AND GAS No one needs to tell an oil man how important good wire lines are in keeping his drilling operations running smoothly. In American Tiger Brand Wire Lines, we produce wire lines that have earned their high reputation in the oil fields by actual performance—on a proved ability to meet every demand put upon them as oil wells go down deeper and faster than ever before.

★ *INVEST FOR VICTORY* ★

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AMERICAN STEEL & WIRE COMPANY

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Indispensable to America's War Effort . . .

GOOD WIRE ROPE!

TAKE CARE OF WHAT YOU HAVE, USE IT PROPERLY AND MAKE IT LAST LONGER. We believe this advice is important to every user of Wire Rope. We have prepared a 48-page booklet of Valuable Facts on Wire Rope Care that will improve performance and definitely extend its useful life. A copy in the hands of your operating men will save money for you and, in addition, will help conserve wire rope supplies for other vital national requirements. Send for your copy. *Remember, a broken rope is a break for the enemy.*

UNITED STATES STEEL

materials can be spared for building new facilities except when they are absolutely necessary. The policy means simply that in the light of existing shortages, it is necessary to put materials and effort into planes, ships, tanks and guns now, rather than putting them into plants which would not produce fighting weapons until a much later date.

In addition, it is necessary to make the fullest possible use of all existing plant facilities which can be used or can be converted to use.

The principles were outlined in a directive, effective immediately, signed by Donald M. Nelson, chairman of the War Production Board, William H. Harrison, director of production, Henry L. Stimson, Secretary of War and Frank Knox, Secretary of the Navy.

The seven criteria which must be met before any project will be approved for construction follow:

1. It is essential for the war effort.
2. Postponement of construction would be detrimental to the war effort.
3. It is not practical to rent or convert existing facilities for the purpose.
4. The construction will not result in duplication or unnecessary expansion of existing plants or facilities now under construction or about to be constructed.
5. All possible economies have been made in the project, resulting in deletion of all non-essential items and parts.
6. The projects have been designed of the simplest type, just sufficient to meet the minimum requirements.
7. Sufficient labor, public utilities, transportation, raw materials, equipment and the like are available to build and operate the plant. The manufactured product can be used at once or stored until needed.

Explore Folsom Dam Site

Engineers of the United States Bureau of Reclamation have started exploratory drilling of the foundation of the Folsom dam site on the American River in California, according to government reports.

The site is being tested in connection with irrigation, power, and flood control studies of the proposed American River Project. The American River studies, begun in 1939, have developed the possibility of an advantageous connection with the Central Valley Project that might indefinitely defer the need for the Delta Cross Channel.

Construction of the Central Valley Project is well advanced at Shasta, Keswick, and Friant dams, and on some of the canals, but construction has not yet been undertaken on the proposed Cross Channel which is designed to divert water from the Sacramento River near Freeport to the San Joaquin River near Stockton.

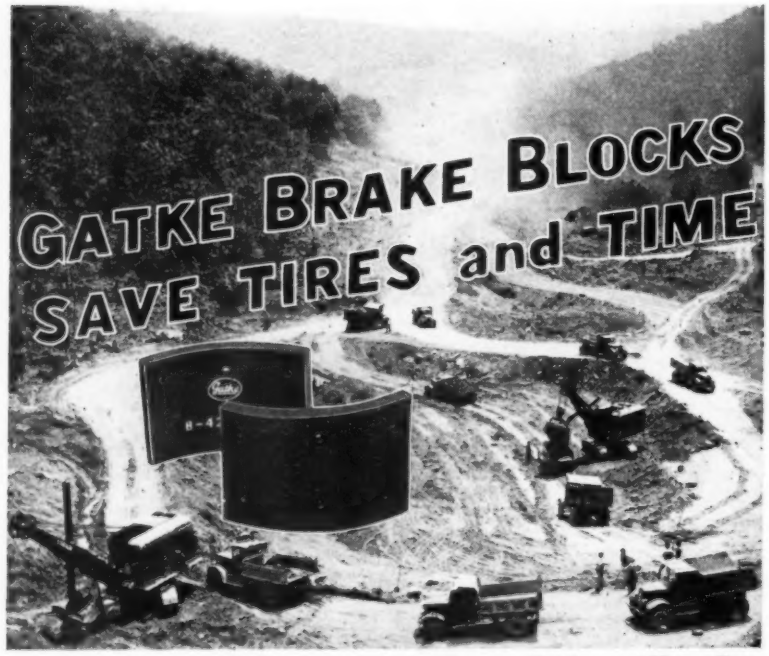
The American River Project originally was proposed in 1931 as a part of California's long-range state water plan. It has been advanced since the war as a source of more electric power for California industry. The project would include large storage dams and hydroelectric plants on both the north and south forks of the American River, probably at the Auburn and Coloma sites, and a third storage dam at the Folsom site on the main river.

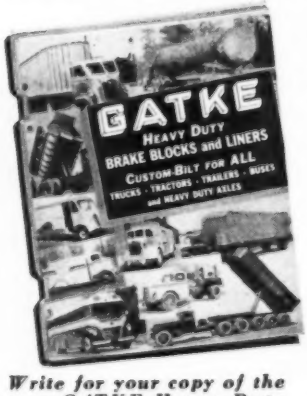
Recent Bureau investigations have indicated the feasibility of constructing a gravity canal south from Folsom Reservoir to a balancing reservoir near Ione, and from there to the intake of the Delta-Mendota Canal at some point on the San Joaquin River south of Stockton. Additional power would be generated at Ione Dam. Water could be delivered to the Delta-Mendota pumping system at an elevation somewhat higher than will be possible by means of the Cross Channel as presently contemplated in the Central Valley Project.

Highways Vital to War Effort

Highway transportation is of vital importance to the war effort in moving materials to industries and in bringing men and jobs together, according to H. S. Fairbank, chief, division of research, planning and information, U. S. Public Roads Administration.

"The highways have a vital role to





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Correct holding power with smooth, non-grabbing action that *saves* tires

Safe, dependable stopping power under all conditions

Extra wear life that keeps equipment rolling with fewer adjustments and less time out for maintenance.

Make this simple test. Use GATKE CUSTOM-BILT Brake Blocks on your next five relines and compare results with the best you have ever had.

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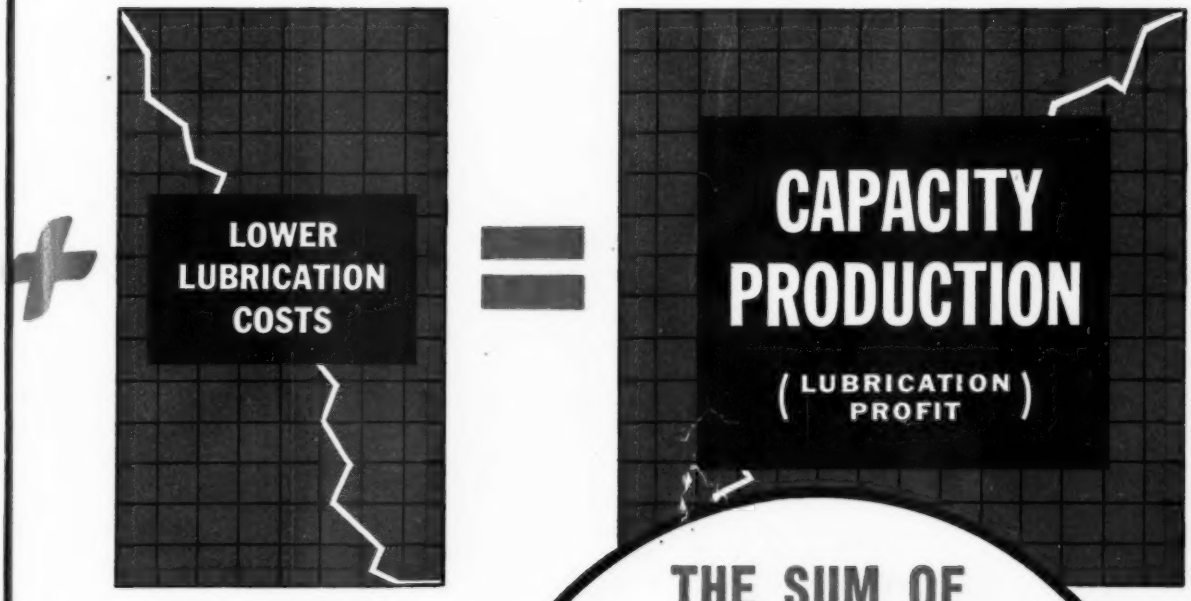

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UBRICATION

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play in the war effort," says Mr. Fairbank. "For example, the Glenn L. Martin airplane plant near Baltimore employs about 30,000 people. All use highway transportation going to and from work. About 350 ride in buses; the remaining thousands are transported in more than 10,000 private automobiles. None of the employes ride the railroad that passes the plant gates; and railroad company officials state that it would be impossible to provide the 100 coaches, 10 locomotives and 30 train crews that would be required for the sixty 10-car train movements a day needed to take over the transport duty now being provided by the passenger cars.

"The Ford bomber plant at Ypsilanti, Michigan, probably will employ more than 50,000 people this year, and it is expected they will travel to work in 22,000 private cars. Plant officials expect to get 25 per cent of their necessary raw materials by motor truck, 75 per cent by rail. Outgoing, the product of the plant will probably move 60 per cent by truck, 40 per cent by air.

"Ninety-five per cent of the 7,000 employes of the Hudson Navy Arsenal in Detroit are brought to their work by highway transportation. The arsenal gets 75 per cent of its raw materials by truck, 25 per cent by rail, and the finished product is transported by the two means in about the same proportions. The Chrysler tank plant in Detroit brings in 50 per cent of its raw materials by truck; and similar examples of the dependence of war industry on adequate highway service and the motor vehicle could be almost endlessly multiplied."

Conserve Your Tires

Warning that failure to take proper care of truck tires can produce a "transportation bottleneck," John L. Rogers, Director of the Division of Motor Transport, Office of Defense Transportation, has urged truck drivers and owners to safeguard their present tire supply.

While tire rationing regulations provide tires for motor transport engaged in war production or essential civilian activities, Mr. Rogers said that until there is a replenishment of rubber stocks, driving practices must be adjusted to conform with approved tire conservation rules. Rationing is possible only so long as the utmost caution is used in consumption of available rubber stocks.

The present supply of tires and tubes is in reality the nation's most important stock pile and reserve, Mr. Rogers declared, in urging truck operators to observe the conservation rules cited by the office of defense transportation to insure the longest possible wear from tires.

These rules (for more informtaion see "How to Get the Most Out of Your Tires" February, 1942, Excavating Engineer), drafted by government experts, emphasize President Roosevelt's request that speed be kept under 40 miles per hour. Driving at excessive speeds is extremely wasteful of rubber due to tire slippage and vehicle sway. Speed also causes breakdown of the fiber cord because of heat accumulation within the casing. Fast driving is particularly injurious to tires on rough uneven roads and on curves.

Maintenance of proper air pressure in the tires is vital. A tire 30 per cent underinflated will give only half the normal tire wear, it was pointed out.

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FOR PAY-LOAD
CLAMSHELL DIGGING
ALL SIZES AVAILABLE
Your good crane deserves one! Real he-man digging power and a hefty sturdiness that will stand up to your toughest goings . . . a Haiss Hi-Power will make money for the man who owns it. Catalog on request.
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-movers of heavy equipment have learned to rely upon
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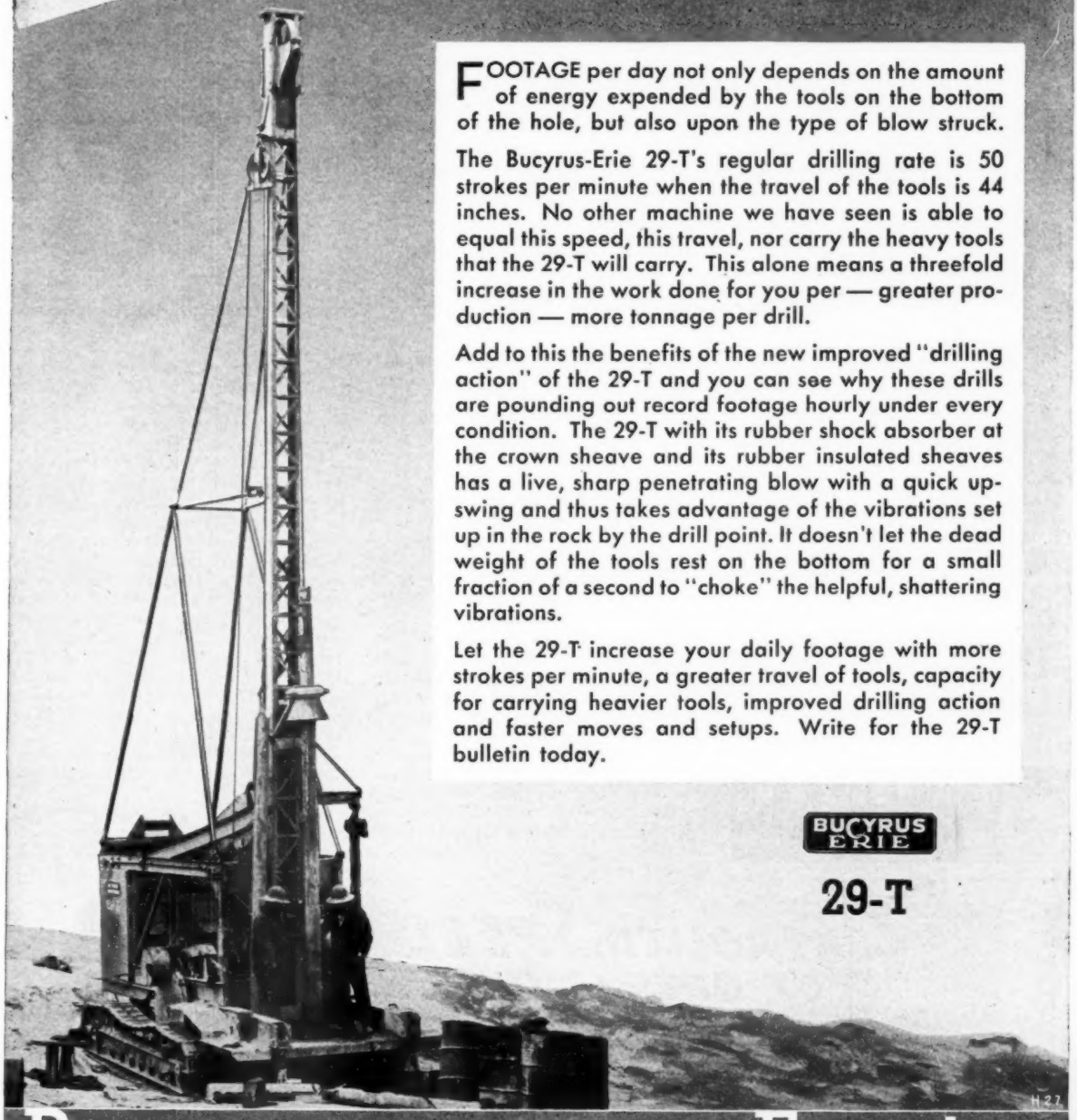
REASONS WHY *You can get more Hole*



FOOTAGE per day not only depends on the amount of energy expended by the tools on the bottom of the hole, but also upon the type of blow struck.

The Bucyrus-Erie 29-T's regular drilling rate is 50 strokes per minute when the travel of the tools is 44 inches. No other machine we have seen is able to equal this speed, this travel, nor carry the heavy tools that the 29-T will carry. This alone means a threefold increase in the work done for you per — greater production — more tonnage per drill.

Add to this the benefits of the new improved "drilling action" of the 29-T and you can see why these drills are pounding out record footage hourly under every condition. The 29-T with its rubber shock absorber at the crown sheave and its rubber insulated sheaves has a live, sharp penetrating blow with a quick upswing and thus takes advantage of the vibrations set up in the rock by the drill point. It doesn't let the dead weight of the tools rest on the bottom for a small fraction of a second to "choke" the helpful, shattering vibrations.

Let the 29-T increase your daily footage with more strokes per minute, a greater travel of tools, capacity for carrying heavier tools, improved drilling action and faster moves and setups. Write for the 29-T bulletin today.

BUCYRUS ERIE

29-T

H-27

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN

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Truck drivers are urged to check air pressure regularly—every day, if necessary, to be sure it is at the proper level.

Overinflation is likewise dangerous and should be guarded against. The tendency of some truck operators to overinflate tires to compensate for overloading is definitely injurious to the tread and tire casing due to the added danger of breaks and blowouts. The practice of partially deflating tires when they become overinflated as a result of heat action is condemned because it results in greater tread wear and tire failure.

Overloading is second only to high speeds as a cause of rapid tread wear and premature truck tire failure. It should be guarded against to prevent impact breaks, bead failures, and flex breaks. Forty per cent overload—not an uncommon practice today—can reduce the mileage wear of a tire 50 per cent. In other words a tire made to last 30,000 miles will give only 15,000 miles if consistently overloaded 40 per cent.

The rules also call for regular attention to tire valves and valve caps. Drivers are urged never to drive without valve caps to prevent slow air leaks from tires.

This Picture Shows a Small Sauerman Scraper Reclaiming Coal Mine Screenings from Waste Pile to Washing Plant.

How to Reduce Cost of Dig-and-Haul Work

On work where materials are to be moved a distance beyond the reach of a boom, a Sauerman Scraper or Cableway has an advantage over other equipment because it is able to dig, haul and place the material in a continuous, straightline operation.

The Sauerman Catalog shows the many ways of cutting costs on material-handling work with these machines.

Write for a copy of this free book.

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SAUERMAN
LONG RANGE MACHINES

West Virginia Employs Effective Safety Program

West Virginia's State Road Commission is successfully conducting a safety program based upon the psychology that its workers can effectively be taught how to prevent accidents through instruction in what to do in case of an accident.

"When a man goes through a first aid course to learn what to do for a broken leg, an arm fracture or other injury," according to Harry Radcliffe, state staff engineer in charge of safety, "he's going to think awhile before breaking a safety rule that might bring such an injury upon himself. It makes him safety conscious and that is the whole secret of a good safety program."

The West Virginia commission inaugurated its safety program in 1938, with state police instructors conducting the initial first aid classes. The training has since been carried on by commission employes and now includes 31 qualified first aid instructors.

"Prior to that time," Engineer Radcliffe states, "the safety of the commission employes was occasionally briefly discussed and thereafter promptly forgotten. We found we could talk our heads off about following safety rules, but it just didn't seem to sink in. But since installing the first aid courses, this commonplace attitude has changed to one of extreme interest. By learning the rudiments of caring for the injured, the men are automatically learning to prevent accidents."

The first year after the safety-by-knowledge program was launched, the commission's compensation rate dropped from $2.50 to $1.63 per hundred dollars of payroll and the second year it went down to 87 cents, the minimum under the commission's classification.

These effective results, it was pointed out, mean a dollars and cents saving of more than $78,000 within two years, in addition to the suffering and heartaches saved employes and their families through the reduction in injuries and fatalities. The commission went without a fatal accident during the 1939-40 fiscal year for the first time in its history.

The road department last year had only 450 personal injuries in a total of 9,882,056 man-hours worked, and these included every accident that involved any lost time whatever, or the attendance of a physician. The average loss was 52 man-hours, with more than 21,000 man-hours worked for each personal injury.

1940 Employment, Accident Experience of Metal Mines

A survey of the metal mines and nonmetallic-mineral mines (except coal) of the United States in 1940 revealed an increase in employment over 1939 and a larger number of employees than in any year since 1926.

Men employed in 1940 numbered 120,120, a 7-per cent increase over 1939. A longer work year (242 days) prevailed in 1940, causing an increase of almost 12 per cent in man-hours over the preceding year. Approximately 15,000 nonfatal lost-time injuries occurred to the employees during the 230,727,699 man-hours of work performed at the mines during the year. The total number of men killed rose from 173 in 1939 to 223 in 1940. However, the accident-frequency rate per million man-hours of employment declined from 67.12 in 1939 to 64.97.

California maintained its position as the leading state with the largest number of employees.

Iron-ore mines employed 23,250 men for 45,238,352 man-hours; copper mines had 19,498 men who worked 48,672,053 man-hours.

CONTROLLED SPEED OF OPERATION
Modern wartime parachutists control speed of descent and directional drift by shroud-line manipulation. Owen bucket closing speed is inversely proportionate to closing power and adjustable reeving makes possible maximum closing speed or maximum closing power whenever either are required by digging or rehandling conditions.
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A SIMPLE WAY TO GET MORE METALS FASTER

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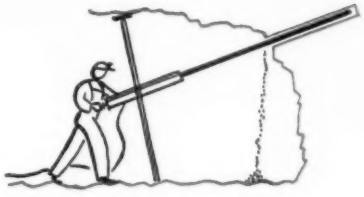

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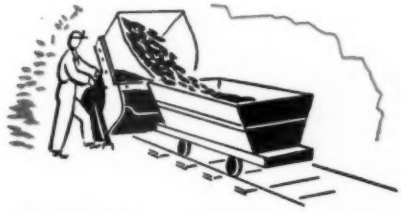

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NOT in the *Contract*

Late on the afternoon of the Sixth Day, when the Creator had made all good things, there was still some dirty work to do, so He made the beasts and reptiles and poisonous insects. When He had finished He had some scraps that were too bad to put into the rattlesnake, the hyena, the scorpion, and the skunk. So He put all these together, covered it with meanness, wrapped it in selfishness, marked it with a yellow streak, and so produced the chuckling sap who darts into a parking space when the car ahead is preparing to back in.

The doctor was visiting Rastus' wife to deliver her twelfth offspring. While riding along with Rastus he saw a duck in the road.

Doctor: "Whose duck is that?"

Rastus: "That ain't no duck. That's the stork with his legs wore off."

A woman resident in China remonstrated with her houseboy for taking her linen into her bedroom without knocking.

"That all right, Missy," said the native. "Every time come, lookee through the keyhole. Nothing on, no come in."

"Conductor, will you help me off the train?"

"Sure, but why?"

"You see, I'm stout, and have to get off the train backwards. The porter thinks I'm trying to get on and he gives me a shove on again. I'm five stations past my destination now."

"But, judge," protested the convicted and sentenced murderer, "I'm in poor health. I can't do a 99-year sentence."

"Well," said the judge, kindly, "just do what you can of it."

Lesson In French

"A doughboy during the first world war went into a small French shop and ordered a pack of cigarettes laying down a five franc note. The Frenchman gave him his pack of cigarettes and put the note in his drawer.

Doughboy: Come on. Give me my change.

Frenchman: No Compre.

The doughboy started storming and in came the top sergeant to investigate the commotion and asked the doughboy what was wrong, the doughboy explained and in the second breath asked the sergeant if he could talk French.

Sergeant: You're darned right I can—watch me—I'll straighten this thing out in a hurry.

Sergeant to Frenchman: Parlez-Vous Francaise?

Frenchman. Oui!

Sergeant: Then why in the hell don't you give the guy his change?

An Irish soldier on duty in Egypt received a letter from his wife saying there wasn't an able-bodied man left, and she was going to dig the garden herself.

Pat wrote at the beginning of his next letter: "Bridget, please don't dig the garden; that's where the guns are."

The letter was duly censored, and in a short time a lorry-load of men in khaki arrived at Pat's house and dug up the garden from end to end.

Bridget wrote to Pat in desperation, saying that she didn't know what to do, as the soldiers had got the garden dug up, every bit of it.

Pat's reply was short and to the point: "Put in the spuds."

"Papa," queried the son, "what is the person called who brings you in contact with the spirit world?"

"A bartender, my son," replied the father.

A young lady went for a swim in a secluded spot, but forgot to take along a towel. She had come out on the bank, and was allowing Nature's balmy breezes to dry her, when she happened to hear rustlings in the bushes nearby.

"Who's there?" she asked.

A rather high-pitched voice answered:

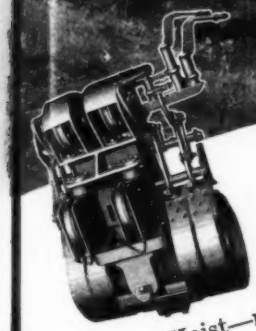
"Willie."

"How old are you, Willie?"

"Seventy-nine, dammit!"

Not a BALK in a BOWLFUL!

with a Buckeye✓ Hoist



NO SIR, you don't have any trouble pulling the loaded scraper bowl up out of the cut when you're using a Buckeye Hoist—no stalled engine—no need to kick out the master clutch. The line goes into action with a smooth, powerful pull at just the right speed to turn the trick, and the tractor keeps right on rolling. Talk about ease of operation! The power just flows through a Buckeye. It's because of the planetary design and the brake and clutch action—no jerks, no slipping. The power is applied properly and its under split-second, fraction-of-an-inch control right at the operator's fingertips.

Built in medium heavy duty and heavy duty models for all tractors. Write for full details and check Buckeye Unitilt Dozers, too.

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CHECK THESE BUCKEYE HOIST FEATURES:

- ✓ Planetary Design – superior for this type of service – longer-lived, easier to maintain.
- ✓ Large Drum Diameter – for longer cable life.
- ✓ Large Cable Capacity – spools enough to handle any tractor equipment.
- ✓ Large Braking Area – Buckeye brakes and clutches take hold smoothly and hang on.
- ✓ Cool Running – heat is rapidly dissipated – brake and clutch bands are in the open – long life is assured.
- ✓ High Leverage – permits easy control on the heaviest pulls with no slippage.
- ✓ Proper Sheave Design – keeps cables running smoother, longer.
- ✓ No Pull on Main Shaft – all transverse loads taken on bearings and housings.
- ✓ And many others.

Built by Buckeye✓

Convertible Shovels

Trenchers

Tractor Equipment

R-B Finegraders

Road Wideners

Spreaders

Graham Brothers

(Continued from page 347)

For that matter, a tractor without a bulldozer would show similar idler wear if it traveled commensurately far in reverse, assuming that the center of gravity of both machines was about the same.

In any case, the bulldozers at the the Rancho plant performed excellently with a minimum of repair. They had to. When a 30-inch conveyor is taking raw material to a plant whose backlog of orders is piled high, there can't be any delays.

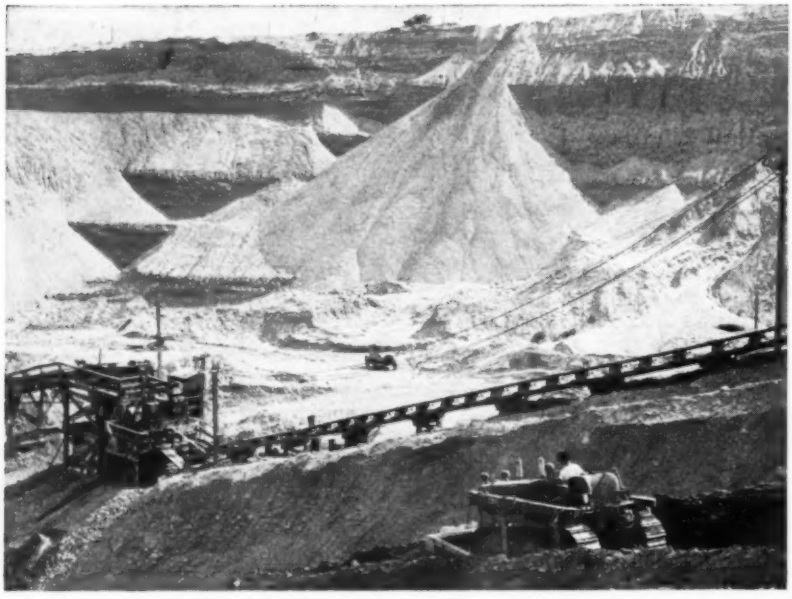
Efficient Plant Layout

Briefly, raw material is pushed to a trap, which feeds it into a 4-inch Traylor primary crusher. It is then conveyed to a search pile. A scalper screen removes dry sand and gravel up to two inches in diameter, which bypasses through to the washer and grading screens. Large rocks retained on the 2-inch scalper move over a Link Belt shaker screen set from 2½ inches to 1¼ inches, and from there into two 1-inch jaw crushers, which break the rock to size.

Elevators carry the rock up to Link Belt and Stephens Adamson trommel screens, one receiving crushed rock and one receiving the gravel from the washer. The trommels grade the rock to size and drop it on the conveyors leading out to six main storage piles. Sand is thoroughly washed before being stored. Yard stock piles are loaded to dispensing bins by a steam crane, but wherever possible trucks are loaded at the plant to prevent double handling.

Using bulldozers, the Graham plant operates from raw source material to finished aggregate in such a way that it quotes a price of 75 cents per ton, plus delivering cost for its product. In a day when war prices are boosting common excavation on many jobs up to 50% of that final figure, it seems that Graham Brothers' results speak most fluently for them.

• General view of the Graham Brother's gravel pit. The International-mounted Bucyrus-Erie bulldozer in the foreground is pushing aggregate down to the conveyor trap.



Weston & Brooker

(Continued from page 341)

Now to return for a moment to the 5′x14′ double-deck W. S. Tyler vibrating screen with the 15/16-inch and 1-5/16-inch hexagonal perforations in its lower deck, we still have to account for the material which passes through the 1-5/16-inch perforations. This material is chuted onto a 4′x10′ Allis-Chalmers double-deck vibrating screen with an upper deck that has ⅞-inch hexagonal perforations and a lower deck with 9/16-inch hexagonal perforations.

• Operations at Weston & Brooker Company's Camak quarry are supervised by R. A. Hemphill, superintendent.

Material scalped off the upper deck goes into a bin for sale as 1¼-inch stone. Material passing through the upper deck, but rejected by the lower deck, is chuted onto a 24-inch 6-ply rubber conveyor belt 50 feet long that carries the stone to a bin for sale as + ⅝-inch to — 15/16-inch stone, mixed with the stone scalped off the ⅝-inch screens of the 5′x7′ W. S. Tyler Hum-mers.

Material passing through the bottom screen of the 4′x10′ Allis-Chalmers vibrating screen falls onto the 24-inch belt conveyor which takes away material that has passed through the ⅝-inch screen of the 5′x7′ W. S. Tyler Hum-mers and ends eventually in the stone storage bins, raw screenings bins, and stock piles.

Stone from the storage bins is loaded out to railroad cars or trucks via a 30-inch 6-ply rubber conveyor belt 180 feet long that delivers the crushed stone from the steel storage bins to a washing chute, which has small perforations in the bottom, and onto which water is sprayed. For railroad car loading the washed stone slides down into the cars through a swivel chute. For batch truck loading the washed stone and sand are carried on a 24-inch 6-ply rubber conveyor belt 300 feet long, to a 6-compartment steel bin. From the compartments the various sizes of stone and sand are apportioned out to trucks through Johnson batching scales.

Derrick Loaders

On each side of the group of six bins in which stone is stored is a 20-ton guyed steel derrick. Both of these derricks swing 1½-yard clamshell buckets from the ends of their booms. The two derricks serve a valuable purpose in re-handling stone from bins to stock piles; from stock piles to loading-out conveyor in any sizes or proportion of sizes desired; and from stock piles to conveyors to finishing crushers for further reduction if needed.

From 135 to 140 men are employed in quarry and plant. At the time the operation was visited, one shift was operating the plant from 11:00 P.M. to 7:00 A.M.; a drill shift worked in the quarry from 5:00 A.M. to 1:30 P.M.; another drill shift worked from 1:30 P.M. to 10:00 P.M.; and the entire operation worked from 7:30 A.M. to 1:30 P.M. The unusual shift arrangement was caused by electric power restrictions, which are probably now even more stringent. During the 14 hours per day that the plant was in operation it was producing about 200 tons of stone and 50 tons of sand per hour.

Water for the operation is obtained from nearby Middle Creek and is pumped by 100 gpm, 200 gpm, 300 gpm and 750 gpm Allis-Chalmers centrifugals and a 750 gpm Worthington centrifugal, all direct driven by electric motors. Drinking water for plant employees and for the neighboring company village is obtained from a 190-foot drilled well with 7-inch casing and is pumped with a Myers 4½ gpm pump into a 5,000 gallon tank.

Complete machine, blacksmith, welding and electrical shops are maintained at the Weston & Brooker Company's Camak operation, and a 7-man maintenance crew works out of the shops to keep quarry and plant equipment in first class working order.

Electric power is purchased from the Georgia Power Co., current used being about the equivalent of 2,000 hp when both plant and quarry are working.

Automotive equipment not previously mentioned consists of a 1½-ton Ford truck, used to carry coal, drill steel, jetty stone slings, etc., at the quarry and a 1½-ton Ford truck with a stake body, used as a pick-up.

W. S. Weston is president of The Weston & Brooker Company; W. B. Jamison is vice-president; W. L. Blackwell, general manager of all operations; Richard Simons, sales manager; W. S. Weston, Jr., assistant superintendent, and L. J. Burriss, chief engineer of all operations. R. A. Hemphill is superintendent of the Camak quarry operations.

Santa Fe Dam

(Continued from page 345)

which are Hall-Scott powered. The side dumps are 20-yard and the end dumps 12-yard capacity.

At this pit one Marion 4121 4-yard and two Northwest 80 diesel 2½-yard shovels are being used. The top of the ramp is of sufficient area that two trucks can dump into the hoppers at the same time. Continuous flow of trucks is thus possible at all times.

TO keep the enemy on the run, it is imperative that we keep our fighting forces supplied with all necessary equipment. Enormous quantities of steel are required for guns, planes, tanks, ships and shells. The more service you can get out of your wire ropes, the more steel you save for these other vital purposes . . . so, the longer you can keep your ropes running, the faster will be the flight of the foe.

Whether or not a wire rope gives the full service of which it is actually capable, depends largely upon the conditions under which it is required to work — unfavorable or improper conditions mean shorter life; to save steel, give your ropes the same kind of a chance you are now giving your tires.

Another important factor in getting maximum service from wire rope is the use of the correct grade, construction and type. On all problems of this kind, feel free to consult our experienced Engineering Department.

For the benefit of all wire-rope users we have published a 44-page illustrated booklet entitled, "Practical Information on the Use and Care of Wire Rope." It contains information that will help all wire rope users get more "Work hours" from every pound of their wire rope steel. We shall be glad to supply a complimentary copy upon request.

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• A Six Wheel truck side dumps a load of rock riprap on an embankment slope at Santa Fe Dam. Note light towers for night operations.

Eight Euclids are hauling screened material from this plant to the nearest point on the embankment over one of the numerous roads which run at right angles to the dam; and three of the side dump trucks are hauling larger boulders from the plant for riprap sides on the embankment.

In addition to the trucks scheduled above, four Euclid-powered 4500-gallon water tanks on Utility trailers and two standard Mack 3500-gallon water wagons are kept busy continuously during all shifts, not only on the embankment but also on the haul roads and in the pits while shovels and trucks are working.

Scheduling of the available trucks has thus been arranged to divide the trucking job at the respective grizzly plants most efficiently according to shovel and screening plant capacities. With each grizzly capable of handling 1200 yards of material an hour, present normal run from each pit is averaging close to the respective shovel capacity of 900 and 1100 yards at the two pits. Some minor tie ups at a grizzly plant may occur occasionally owing to the great variance in the character of the material being excavated. The debris basin turns up material running all the way from sand to boulders as large as two and three feet in diameter, and for this reason occasional clogging in the bars is unavoidable.

Of the material supplied to the embankment, that under 6 inches is being spread adjacent to the clay core in 12-inch layers and watered while the trucks are running and spreading. Boulders over 6-inch diameters are providing riprap four feet thick on the upstream side and rock fill on the downstream side, this varying in thickness.

Spreading of clay core section and compaction is usually done on a special night shift and thus it is possible to use some of the same Euclids which haul screened rock during the two previous shifts. The clay is being laid in 6-inch layers and then graded and compacted.

In wet compaction two sets of sheepsfoot tandem rollers are being used, hauled by Caterpillar D8 tractors. All of the tractor equipment used in miscellaneous work and which includes 11 D8 Caterpillars, 2 D7 Caterpillars and one International TD18 are working practically all of the time with dozers mounted, these being Wooldridges and LeTourneaus.

In addition, two Wooldridge 15-yard and one LeTourneau 15-yard scrapers were used during general clearing operations and are kept as standby equipment, being used from time to time on other miscellaneous earth-moving jobs near the embankment and at the outlet and spillway areas.

One tractor and dozer is kept employed constantly in each pit while material is being excavated, serving the shovels and assisting in keeping new turning areas levelled for trucks as the pits are gradually increased in size.

Place 30,000 Yards Per Day

With two regular shifts running from 8 to 4 and 4 to midnight, present operations are resulting in approximately 30,000 yards per day being placed in the main embankment.

One of the few off-the-job excavating operations is the quarrying of rock in the mountains upstream, this material being used to line the sides of the spillway channel. This work is being done by a sub-contractor, Tobin Quarries, Inc., from a quarry located in Fish Canyon, about six miles above the dam. Derrick stone, running from 3 to 7 tons, is being used to line the bottom of the channel immediately below the stilling basin and below the spillway.

The derrick stone will be overlaid with riprap composed of quarry run rock which comes all the way from 25 pounds to a ton, and all will be grouted with concrete. For this construction below the outlet works and for levee protection along the spillway, 50,000 cubic yards of derrick stone and 100,000 yards of quarry run rock will be required.

Water, unless there should be a serious flood in the area, which has been known to happen within the last few years, is little problem at Santa Fe Dam, as there was no drainage of working areas necessary; while water for the job itself is furnished from two deep wells right on the property.

A problem arises, however, from the fact that one of the main transmission lines of the Los Angeles Bureau of Power and Light from Boulder Dam crosses the line of the Santa Fe Dam construction at two points, and will have to be relocated before the job can be completed. The rock and gravel plants nearby in the big fan of the San Gabriel wash will continue to operate as before, because they are located just outside the area involved in the building of the dam.

SAN VICENTE DAM *Speeded Up* WITH 20 *Easy Holding* JB-5 JACKHAMERS AND 10 FM-2 WAGON DRILLS

The San Vicente Dam in California, part of a long-range program to provide water facilities for the district, had to be speeded up to take care of the rapidly increasing war industries in that locality. The rock formation was extremely difficult to drill. In some places a steel would go eight feet; in others, only a few inches.

Speed on this project was of prime importance to the war effort. To cope with the tough drilling problem and to speed up the work, L. E. Dixon, the contractor, used 20 Ingersoll-Rand JB-5 Jackhamers and 10 FM-2 Wagon Drills. Because of their easy-handling qualities, these machines were well-liked by the operators. Their dependability and durability were thoroughly proved throughout the job.

Fast, dependable Ingersoll-Rand Rock Drills are used all over the country on jobs such as this —jobs so vital to our war work.

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Notes from the manufacturers

Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa., announces the appointment of L. D. Ridgon as manager of a $14,000,000 plant to be constructed in western Pennsylvania for the production of Navy equipment. The Stone and Webster Engineering Corporation has been selected to construct the project.

The Austin-Western Road Machinery Company, Aurora, Illinois, announces that McClure Kelley, who began his association with the company in 1929 will succeed Samuel F. Beatty as president of the company. Mr. Beatty has been associated with the company for 43 years and has been president for 15 years.

The Construction Machinery Branch of the Division of Industry Operations has announced the establishment of a used construction equipment section according to Joseph F. Ryan, Branch Chief. Hamilton O. Penn, former president of the H. O. Penn Machine Company has been named head of the new section which will survey the used equipment situation throughout the country and work out plans under which all available machinery can be put to use.

Gar Wood Industries, Inc., Detroit, Michigan, announces that Frank H. Dewey, General Manager of the Gar Wood Air Conditioning Division, has been elected a Vice President of the company. Mr. Dewey will continue his duties in the Air Conditioning Division.

Hercules Powder Company, Wilmington, Delaware, announces that J. B. Wiesel, director of sales of the cellulose products department, has been appointed advisor to J. B. Davis, chief of the protective and technical coating section of the War Production Board. He is to have charge of the allocation of nitro-cellulose and ethyl cellulose. Mr. Wiesel's time will be divided between his work with Hercules and the government. The company is contributing his services.

Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, announces that B. W. Clark, vice president in charge of the merchandising division has been appointed vice president in charge of company sales. He succeeds Ralph Kelly who resigned to become executive vice president of the Baldwin Locomotive Works. Mr. Clark will transfer his headquarters from Mansfield, Ohio to Pittsburgh.

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Operate any steam or electric dredge or shovel. In good health—over draft limit—no dependents—go anywhere. 40 years experience at stripping, dredging, and construction work. Box 9195

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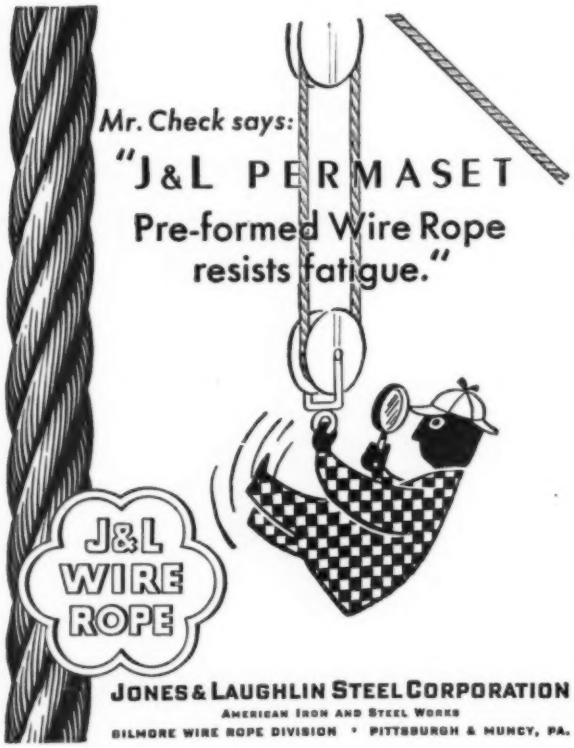
Crane Operator experienced on Bucyrus-Erie ⅜-yd. 10-B crane wants work in or near Wisconsin. Age 35. Married. Two children. Selective service, classification 3-A. Can make ordinary repairs. Box 9196

SHOVEL-DRAGLINE-CRANE OPERATOR

Ten years' experience on gas and diesel machines offered by Wisconsin operator. Has worked about 5 years on shovel and 5 years on dragline-crane. Can do own repair work. 46 next birthday. Wants steady job in one locality as quarry or gravel pit. Prefers to operate Bucyrus-Erie or Koehring. Married; one child. Steady worker. References. Box 9189



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on your blast hole drilling tools.

CAST STEEL - HEAT TREATED

BUCYRUS-ERIE, *South Milwaukee, Wis.*

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New trade literature

Title: **"Standard Handbook for Electrical Engineers"**

Subject: The seventh edition of this standard handbook is written to meet the fullest expectations of the electrical engineer. The pattern for this complete revision was set by current users of the book. It is an orderly compilation of the working-tool information of electrical technology which has been authenticated by research and experience and is now accessible in compact form in this edition. However, there has been no basic departure from the familiar sequence which was evolved by predecessors through six preceding editions. Illustrations have been used even more profusely, but only where they contribute to pertinence and applicability.

Where to Get: McGraw-Hill Book Company, Inc., New York City. Price $8.00.

Title: **"LaPlant-Choate Complete Equipment"**

Subject: A new 16-page booklet describing the earth-moving, land clearing and snow removal equipment manufactured by the LaPlant-Choate Manufacturing Company. Each model is described generally with explanations as to size and capacity. The fact that all equipment is built exclusively for use with Caterpillar tractors is emphasized. Sections are devoted to cable-operated scrapers, hydraulically operated scrapers, and the new CW-10 Carrimore 10 cu. yd. scraper. Trailbuilders, bulldozers, tampers, rippers and other tools are also included.

Where to Get: LaPlant-Choate Manufacturing Company, Cedar Rapids, Iowa. Free upon request.

Title: **"Speeding Mining Operations"**

Subject: A new 12-page illustrated folder is now available showing the complete line of LeTourneau mining and materials-handling tools on some of the largest mining operations throughout the world. Large pictures with descriptive captions on how the job was done is the theme of the booklet. Modern methods and equipment for increased production is explained.

Where to Get: R. G. LeTourneau, Inc., Peoria, Illinois. Free upon request. Ask for form number A-282.

Title: **"Quick Selector Catalog"**

Subject: Issued twice a year, this catalog simplifies the selection of many types of electrical equipment. A number of additions and changes have been made in the 64 page 1942 revision. The general suggestions covered include safety switches, breakers, multi-breakers, panelboards, motor controls and motors. New application data on latest equipment in each of these groups has also been included. Despite revisions, the general format of the catalog has been retained.

Where to Get: Department 7-N-20, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania.

Title: **"Rex 34-E Paver"**

Subject: A 12-page bulletin describing the 1942 Rex 34-E Paver printed in two colors. Photographs of field operation and cutaway view of the batch transfer door are presented. Also included are complete specifications.

Where to Get: Chain Belt Company, 1600 West Bruce Street, Milwaukee, Wisconsin. Free upon request.

Title: **"Stepping Up War Production with Redwood"**

Subject: A timely 8-page bulletin telling by picture and caption the how, where and why versatile California redwood is serving in many applications important to the war effort. This new bulletin was especially prepared to acquaint engineers, architects, lumber dealers, specification writers, contractors and others in situations where jobs are done better and quicker with wood then with materials formerly used but now under war restriction.

Where to Get: California Redwood Association, 405 Montgomery Street, San Francisco, California. Free upon request.

Title: **"Specifications for Quick Repairs to Bombed Surfaces"**

Subject: A timely asphalt construction series publication just issued containing two main divisions: "Materials"; and "Preparation and Composition of Mixture."

Where to Get: The Asphalt Institute, 801 Second Avenue, New York City. Free upon request. Ask for Specification CP-1.

Title: "Care and Maintenance of Elevator Belting."

Subject: Consisting of 24 pages, every paragraph of the bulletin is packed with important instructions for the care and maintenance of belting as well as chapters containing a wide range of belt data, valuable when considering installation or repair problems. It is considered a guide to economical material handling with rubber belts.

Where to Get: B. F. Goodrich Company, Akron, Ohio. Ask for catalog section 2800. Free upon request.

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LOAD LUGGER

You can aid the nation's conservation program by using a LOAD LUGGER on your truck chassis, and employing 5 to 10 detachable dump buckets for handling materials faster, cheaper and with fewer trucks.

The Brooks System saves time, reduces maintenance, conserves equipment and multiplies man-power by increasing the efficiency of hand loading. On scores of jobs, it has been shown that *one* LOAD LUGGER with several buckets can haul and dump more yardage per day that a fleet of ordinary trucks.

Low Headroom
No Counterweights
15 Seconds, Lift or Dump
Fits any Truck Chassis
One-piece Bucket

For excavating, quarry operations, road work, construction and material handling. Ask for Catalog No. 44.

307 Davenport Road Knoxville, Tenn.
Distributors in all Principal Cities

Brooks EQUIPMENT AND MFG. CO.

For your convenience in writing to Brooks Equipment and Mfg. Co., you will find a card bound in this issue.

BARGAINS IN USED EQUIPMENT

FOR SALE, RENTALS, BUSINESS OPPORTUNITIES, TRADES, ETC.

To the reader wishing to advertise used equipment in the "For Sale" Section: All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 60c per line. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Holding up your advertisement one month to secure approval of revised copy or an additional remittance may cost you real money in a lost sale. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

To the reader wishing to answer "For Sale" Section advertisements appearing on these pages: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

SMALL SHOVELS, CRANES AND DRAGLINES

Up to 2½ Cubic Yards

MODEL 150 hydraulic control P&H gasoline combination dragline and back hoe, mounted on caterpillars and equipped with 35' dragline boom, and ½ yard dragline bucket. Bought new late 1940—used on one job only. Located at present South Portland, Maine. Also 12-ton Trailer with 8 pneumatic tires. Box 2886

BUCYRUS-ERIE 50-B Electric Shovel. 30' boom. 17' dipper handle. 2-cu. yd. dipper. 3 motor suitable for power supply 3 phase 25 cycle 440 volt. Excellent condition. Located Southern Wisconsin. Box 2750

BUCYRUS-ERIE 37-B Electric dragline, equipped with 60 hp Westinghouse induction motor for 3 phase 60 cycle 440 volts AC. Good working condition. Located California. Box 2879

LARGE SHOVELS, CRANES AND DRAGLINES

2½ Cubic Yards and Over

LIMA 1001 Electric Dragline. 60' boom. 2½ yard Heavy Duty Esco drag bucket. 1000' power cable. Motor 200 HP Slip ring type 3 phase 60 cycle 440 volt. Excellent condition. Located California. Box 2747

REBUILT 3-T MONIGHAN DRAGLINE. Shop No. 391. Good operating condition. Located Central Oregon. Available now. Box 2882

BUCYRUS-MONIGHAN 3-W Diesel Dragline. 85' boom. 3-yd. AX drag bucket. Located Northeastern Oklahoma. Very good condition. Box 2727

FOR SALE: Osgood Crane 65' boom, ⅞-yd. digging bucket, self starter, excellent general condition. Rent $400.00. Sale $4,000.00, location New York. Box 2890

CLASS 14 electric dragline, originally steam, 100' boom, 40' and 60' sections, 2 cu. yd. bucket. Caterpillar mounted, equipped for operating on 2300 volts, 60 cycles and 3 phase. Located near Texarkana, Texas. Box 2876

FOR SALE

MARION MODEL 125 electric shovel, crawler mounted. 55' boom, 36' handle. 2½-yard bucket. For power supply 3 phase. 60 cycle. 2300 volts. Box 2854

TRACTORS, SCRAPERS, 'DOZERS, GRADERS, ETC.

2 MODEL L A-C TRACTORS, silently geared niggerhead winches. 27-E Rex paver. Cletrac 55; also parts for Cletracs 35 & 55. Bulldozers, Garwood & Isaacson, complete 10 hydraulic dumps, 2 & 2½ yard. 12 Hercules JXC gas motors. Parts for Chev., Ford, G.M.C., Indiana, Dodge and Federals. Sola, 95 Flat Shoals Ave., Atlanta, Ga.

FOR SALE: Austin-Western twelve yard hydraulic scraper with Waukesha Motor on rear of scraper, Caterpillar 65 tractor, both machines in good shape.

Bert Smith Road Machinery Company, Enid, Oklahoma.

FOR SALE: Used Bucyrus-Erie Bullgrader. Good condition, for attachment to Standard Tread T-35 TracTracTor. Located Missouri. A real bargain. Box 2889

FOR SALE: two "60" Tractors @ $1,000.00 each. Three Athey Trac Wagons 10-13 Yd. @ $1,000.00 each. One 3" No. 11 Triplex C.H.&E. Pump in excellent condition @ $1,000.00. Frowine Construction Corporation, 821 Prospect Street, Portsmouth, Ohio.

MISCELLANEOUS EQUIPMENT

COMPLETE 1½ yd. high lift shovel front end equipment for K-44 Link Belt. Excellent condition. Bargain. Stuart M. Christhilf & Co., 200 E. Lombard St., Baltimore, Md.

FOR SALE: 2 yard dipper with new front, new bail lugs, new side plates, and is in A1 condition. This is a heavy rock dipper complete with bail but without bail pins or tooth bases. Box 2891

FOR SALE—Special Electric Tower Excavator equipped with grizzly and crusher for shaft and underground belt disposal. Head Tower on flanged wheels and rails, and arranged for full rotation. Tail tower on caterpillars for operation at 700' radius at any point within a circle. Electrical equipment 3 phase, 60 cycle, 2300 volts Ward-Leonard with 200 hp Introduction motor. Box 2878

5-YARD PAGE rock bucket weighing about 14,000 lbs. and in very good condition, also have 100 extra tooth points. Reasonably priced. Available immediately. Box 2887

FOR SALE: ¾ yd. type Bucyrus-Erie dipper, forward drum, shovel boom, caterpillar, frame, and swing base. 108', 14" cast iron flange pipe, 14 bolt, 8' length. 14" tee and ell.

P. J. Lotte, Kalamazoo, Michigan.

FOR SALE: 1 Koehring 27E Paver with all latest improvements. Model 2A. Factory serial No. 16292—in perfect working condition. Price $5,000.00 F.O.B. Frowine Construction Corporation, 821 Prospect Street, Portsmouth, Ohio.

SHOVEL ATTACHMENT. ¾-yd. Bucyrus-Erie 21-B, chain crowd steel dipper sticks, 85% new, $750. Located Colgate, Okla. Also two low boys goose neck dragline trailers—Tandem, carries 45,000 lbs., and single axle, carries 30,000 lbs. P. O. Box 312, Atlanta, Texas.

Car Transporter

STACKER TYPE MACHINE consisting of self-propelled caterpillar mounted, inclined bridge on which 3-cubic yard material transporting car travels and dumps automatically at a distance approximately 145' horizontally and 80' vertically from loading point. Machine in good condition and priced to sell. Operates on 60-cycle, 3-phase, 2300 volts. Further information on request.

Box 2772

COAL STRIPPER & LOADER

320-B Steam Stripper, 90' boom, 56' sticks, 7-yard dipper, truck mounting, coal hoist, including set new sticks.

41-B Steam Loader, 27' boom, 16' sticks, 1½ yard coal loading, caterpillar mounting. Boilers on both were inspected last summer.

Location Middle West
Liquidation prices
Write Box No. 2885.

FOR SALE: 2 trailers pneumatic tires for hauling tractors, highlifts, bulldozers, etc. 1 tilting platform.

Riemer Brothers, 2900 Armitage Avenue, Chicago, Illinois.

SURPLUS MINE EQUIPMENT
BARGAIN PRICES

Write for prices of this equipment. Save money. Located in Minnesota.

1—Motor, 135 H.P. squirrel cage, 1150 r.p.m., 220 v., 3 ph., 60 cy., A. C.: compensator.

3—Rotary converters, 300 Kw., HCC-6-800-1200. Forms P, D, & V, 6 and 8 phase.

1—Switchgear for 3-phase rotary converter, complete, semi-automatic.

3—Transformers, 300 Kw., 66,000 V. Primary, reconnected for 22,000 V. Primary.

1—Ainley placer gold machine, complete. 1-bowl with feed hopper for dragline operation. 40-50 tons per hour.

3—Pumps, steam (1 gas engine driven) from 49 to 3700 g.p.m.

Box 2752

WANTED

WILL TRADE

Have Bucyrus-Erie Model S-108 equipped with 6—1200x20—14 ply tires in excellent condition. Will trade for Bucyrus-Erie model S-90 Scraper equipped with either 6—1100x20 or 6—1300x20 tires. Reply giving serial number, location and advise condition of tire equipment.

Box 2894

WANTED: Boom, Dipper Stick and Dipper for 33-B Crane, Serial No. 15682. Want complete equipment to change Crane to Shovel. R. E. Townsend Corp., Ann Arbor, Michigan.

WANTED: Person with 5 yard dragline and a yard loader, or the equivalent of the above, to strip a 300 acre tract of coal having very little rock overburden and ranging from 6 feet to 37 feet in depth. This is a high quality bi-product coal and we have orders on hand for 1000 tons per day. Box 2893

WANTED TO BUY: 50-B Bucyrus, or equal, crawler steam shovel, or Diesel; also 2-yd. crane or dragline.

Gasoline or Diesel standard gauge gas locomotives (3) 20 to 30 tons, MCB.

Trench excavators (2) small service type, also larger ladder type, Buckeye or Parsons. Locomotive crane, standard gauge 8 wheel, 25-ton, 55' boom, steam or gas. Gas crane, and pull shovel, 1-yd. or 1¼, crawler. Box 2892